PC-KWIK®

DOS 5.0 Compatible

POWER DISK

THE HIGH PERFORMANCE TUNE-UP FOR FASTER, SAFER DISKS

IBM DOS VERSION

- *File defragmenting*
- *Optimization*
- *Disk testing*
- *Bad sector remapping*
- *Power Scope*
- *File location displays*

MULTISOFT

Software Digest

Rated #1
(Vol. 7, No. 8)

For Technical Support

Call 800-888-5945 or b503-644-5644

FAX 503-646-8267

(Please include return FAX #)

CompuServe: GO PCVENA, select section 14, or email 76004,151.

PC-KWIK®

POWER DISK™

from MULTISOFT

Multisoft Corporation
15100 SW Koll Parkway
Beaverton, OR 97006

Program and Manual

Copyright 1989, 1990 Multisoft Corporation

All Rights Reserved

Document 1302

PC-Kwik is a registered trademark of Multisoft Corporation.
Power Disk, PowerScope, FileFind, and FileView are a trademarks of Multisoft Corporation.
Bernoulli Box is a trademark of IOMEGA Corporation.
COMPAQ is a trademark of COMPAQ Computer Corporation.
DESQview is a trademark of Quarterdeck Office Systems.
IBM and Personal System/2 are registered trademarks of International Business Machines Corporation.
Microsoft and Windows are registered trademarks of Microsoft Corporation.

IF YOU ARE IN A HURRY

Start here if you are in a hurry and you are familiar with IBM PCs in general and with your computer in particular. To install the Power Disk program, place the Power Disk distribution diskette in drive A or B. If you are using drive A, type:

```
A:
INSTALL
```

If you have a monochrome monitor, use the /BW parameter for INSTALL.

INSTALL copies all the files on the distribution disk in drive A to the subdirectory \PCKWIK on your boot disk, or into any other subdirectory or disk you specify. Now you can use Power Disk to analyze, test, and reorganize all the disks on your system.

Warning! Never run Power Disk from within a multitasking environment such as Windows or DESQview! Always unload *all* memory-resident programs before running Power Disk.

Because Power Disk changes the locations of files on your disk and changes the File Allocation Table, you may corrupt any data or program files which are open under the multitasking environment. Always unload all memory-resident programs before running Power Disk. Power Disk automatically disables

Super PC-Kwik and the Power Pak programs, so you need not disable those yourself. But do unload any other programs you may be running before running Power Disk.

Before you reorganize your disk, run Power Disk's Disk Analyzer and Disk Tester to verify that the target disk's directory structure is sound and the data can be read. Change to the disk and directory where you installed Power Disk. Then, from the DOS prompt, type:

```
PCKPDISK
```

and press <Enter>. Press <Enter> or click the mouse button to select the current drive or partition, then choose Analyze from the menu. When the analysis is done, return to the main menu to select disk testing.

If you get any warning or error messages, refer to Appendix A and correct the condition before proceeding with disk reorganization.

If you would like to analyze any other drives or partitions, select Choose a New Disk from the main menu, choose a drive letter, and select Analyze again.

Warning: Although we believe Power Disk is the safest reorganizer you could use, we cannot claim to have tested all possible configurations. *Before you use Power Disk, we strongly advise that you first back up any disk or partition to be reorganized.*

Once you are confident your hardware and software work properly with Power Disk, you might consider running Power Disk daily as a routine procedure. You can add Power Disk commands to your AUTOEXEC.BAT file so that Power Disk runs each time the system boots. See Section 4, *Using Power Disk in Batch Mode*, for information on useful options. You can also change or add parameters to fine-tune Power Disk for your system.

TABLE OF CONTENTS

IF YOU ARE IN A HURRY iii

Section 1: PREFACE 1
  About This Manual 1
  For More Information 2
  Conventions in This Manual 3
  Using the Mouse or Keyboard 3

Section 2: INTRODUCTION 5
  File Fragmentation 5
  Features 6
    Software Supported 6
    Disks Supported 6
    Interactive and Batch Modes 7
    Reorganization 7
    Strategy Options 8
    Sorting 9
  Safety Features 9
    Analysis 10
    Testing 10
    Reporting 10
    PowerScope 10
    Automatic Operation 11
  Precautions 11

Section 3: INSTALLING POWER DISK AND USING INTERACTIVE MODE 15
  Installing Power Disk 15
  Using Interactive Mode 16
    Setting Defaults for Interactive Mode 19
  Analyze Only 19
  Testing Your Disk 21
    Bad Blocks 23
    Readable File Clusters 23

Unreadable File Clusters 24
PowerScope 25
Reorganize the Disk 25
Zooming 27
Choose a New Disk 29
Modify Program Options 29
Reporting Options 30
File Handling Options 32
Protection Level Options 33
Strategy Options 34
Hints on Selecting a Strategy 35
Display/Save Options 36
Sort Directories 37
Escape to DOS 39
When You Are Done 39

Section 4: USING POWER DISK IN BATCH MODE 41
Introduction 41
Running in Batch Mode 41
Screen Output 42
Strategies for Reorganization 42
Automatic Operation 43
Conditional Reorganization 43
Once-a-Day Scheduling 44
Day-of-the-Week Scheduling 45
Using More Than One Conditional Test 45
Directory Sorting 46
Examples 47

Section 5: POWERSCOPE 49
Introduction 49
What is a Cluster? 49
Display Features and Map Resolution 50
Navigating Around the Map 51
Zooming 52
Displaying Fragmentation 53
Displaying Files 53
Finding a File 55

Finding a Directory 56
Saving Screens 57
PowerScope Function Key Summary 58

Section 6: COMMAND PARAMETERS 59
Introduction 59
General Format 59
Batch and Interactive Mode Parameters 61
General Options: 61
Reporting Options: 61
File Handling Options: 62
Protection Level Options: 64
Error Correction Options: 64
Strategy Mode Options: 65
Interactive Mode Parameters 65
Batch Mode Parameters 66
Examples 70

Appendix A: ERROR MESSAGES 73
Appendix B: RECOVERABLE DISK ERRORS 95
Appendix C: CONTROLLING FILE PLACEMENT WITH THE DIRECTORIES IN ORDER STRATEGY 99
Appendix D: ACCESSING ASCII FILES 107
Appendix E:USING POWER DISK WITH VERY LARGE DISKS 111
GLOSSARY 113
INDEX 117

Section 1

PREFACE

Thank you for purchasing our PC-Kwik Power Disk disk analysis and tuning software. PC-Kwik Power Disk is a very fast and very safe utility for organizing file data on DOS-formatted computer disks. In addition to being one of the fastest and safest disk reorganizers in the industry, Power Disk can give you new insights into the way your data is stored as well as analyze and improve the reliability of your disk drives. Not only does Power Disk make disks faster under ordinary circumstances, but Power Disk also magnifies the performance boost provided by Multisoft's PC-Kwik Power Pak. It includes a powerful defragmenter to enhance the performance of reading information from hard disks, diskettes, or cartridges. You can use Power Disk on a daily or weekly basis to keep your disk files well ordered.

About This Manual

This preface describes each section of the manual and explains the typographic conventions we use throughout the manual.

Section 2, *Introduction*, contains information about disk fragmentation in general and an overview of Power Disk's features.

Section 3, *Installing Power Disk and Using Interactive Mode*, gives instructions for copying Power Disk from the distribution diskette onto your hard disk and shows you how to use Power

Disk in Interactive Mode. We recommend you use Interactive Mode until you are comfortable with the options and parameters available. Then you may wish to run Power Disk as a batch job.

To use Power Disk with batch files, see Section 4, *Using Power Disk in Batch Mode.*

Section 5, *PowerScope*, tells you how to use PowerScope to get detailed information about your disk usage, file locations on your disks, and file fragmentation.

Section 6, *Command Parameters*, gives information on all the parameters available in both Interactive and Batch modes.

The appendices include information about errors and error messages, accessing ASCII files, controlling file placement on the disk when you reorganize your disk, and using Power Disk with very large capacity disk drives. A glossary defines some of the terms used in this manual.

For More Information

Information which became available too late for this edition of the manual is contained in a file named PDSKREAD.ME on the Power Disk diskette. This file may also contain information on restrictions that apply to specific hardware and software configurations. See Appendix D for information on accessing this file.

Conventions in This Manual

We use several typographic conventions in this manual to make it easier for you to use.

When You See	It Means
COMMANDS	Text you must type in exactly as shown, such as DOS commands.
italic	The general form of something you must specify; for instance *d* stands for the drive designator in general. You would supply the letter of your specific drive, such as A, B, or C.
<key>	Represents keys on your keyboard other than the letter and number keys, for instance, <Esc> represents the Escape key.

Using the Mouse or Keyboard

When you use Power Disk in Interactive mode, you can use your keyboard, your mouse, or a combination to make choices on the menus, maps and displays. Whenever we tell you to choose an item, you can either use the mouse to move the highlight bar, or you can use the arrow keys to move the highlight bar. In general, the <Enter> and the left mouse button work the same way; they both choose the item highlighted. The right mouse button works the same way the <Esc> key does, and usually goes back to the previous menu or stops whatever action is in progress. If the instructions say "Press any key", you can also click either mouse button.

Section 2

INTRODUCTION

This section discusses file fragmentation and how Power Disk defragments your files. It covers the main features of Power Disk, lists some precautions to take when using Power Disk, and gives the restrictions and limits on using Power Disk. If you already know about file fragmentation, you may wish to skip the first part of Section 2 and go to the part titled *Features*.

File Fragmentation

When you copy or modify a file, DOS often splits it up, or *fragments* it, storing it over many different locations on the disk. Because of this, reading and writing file data becomes slower than if all the data were together in one contiguous block. The disk drive must move its heads to each location to retrieve or write the data for one file.

Power Disk eliminates file fragmentation by rejoining the parts of the fragmented file and saving it to one contiguous location. Power Disk also discourages future fragmentation by gathering all the empty disk space together in one place, so future file creations use contiguous space on the disk.

With Power Disk, you can reorder the sequence in which files are stored on your disks. For example, you can place files within the same directories together, place special files toward the front or back of the disk, or place files that do not tend to become fragmented at the front of the disk.

Features

Multisoft's PC-Kwik Power Disk was designed for flexibility, speed, and safety. It provides fast disk analysis, directory sorting, disk reorganization, and disk testing. There are choices of strategies, sort orders, protection levels, and versatile graphic views of data storage. And Power Disk reorganization is the safest in the industry. You should never lose data while running Power Disk on a properly operating PC.

Software Supported

Power Disk is compatible with MS-DOS and PC-DOS versions 2.0-5.0 and DR DOS 5.0; and with Compaq DOS 3.31, as of the printing of this manual. It may also be compatible with other vendors' versions of DOS. Check the \PCKWIK\PDSKREAD.ME file for more up-to-date information about compatibility with DOS systems from other vendors.

Disks Supported

You can use Power Disk on both fixed and removable disks. It supports MFM (standard XT or AT), RLL, IDE , ESDI, and SCSI hard drives, as well as any floppy drive formatted by DOS (360K bytes to 1.4M bytes) or on RAM disks with a 512-byte sector size. It also supports cartridges such as Bernoulli Boxes, read/write optical drives, and Plus Passports. Power Disk supports disks with multiple logical drive partitions and partitions with more than 32 megabytes of storage, including disks partitioned with DOS 4.0 or Compaq DOS 3.31 and with most commonly used partitioning programs.

Interactive and Batch Modes

You can run Power Disk as an interactive program or in Batch mode from a batch file. We suggest you use Power Disk interactively until you are familiar with its options, then set up Batch mode for daily, automatic use.

Interactive mode allows you to analyze, test, explore, sort and reorganize your disk by responding to menu options on the screen. Power Disk prompts you for any information or options that you need to input. You can use the keyboard or your mouse to move from menu to menu and to choose options. You can display, change and save the default options at any time.

Batch mode allows you to run Power Disk from a batch (.BAT) file or from the DOS prompt without user interaction. You control the program options by including parameter values on the command line.

Batch mode outputs very little information to the screen. To see a full analysis or reorganization report, specify reporting to a disk file or to the printer. Running in Batch mode requires no interaction, although you can stop it at any time by pressing the <Esc> key. If the program finds any errors during reorganization, it issues an error message and stops the reorganization.

Reorganization

Power Disk moves file data on the disk to eliminate file fragmentation. During reorganization, Power Disk avoids moving system files and gives you the option whether to move hidden or read-only files. You can also choose whether to have empty files and empty directories deleted.

Strategy Options

Power Disk allows you to choose from several defragmenting and reorganizing strategies, and to save the options you choose for use each time you invoke Power Disk. You can use:

Speedy Reorganization (the default) is the fastest reorganization strategy that completely defragments and closes up all empty space by moving as few files as possible.

Fragmented Files Last places currently fragmented files at the end of the disk with all non-fragmented files at the front. After using this strategy several times, the disk is less likely to become fragmented and tends to defragment more quickly. A disk that you consistently reorganize using this strategy should require reorganization less often.

Directories in Order provides fast disk performance by placing files on the disk in the order the subdirectories appear to DOS. This gives you the most control over file placement. Using a special control file called \PCKPDISK.FIL, you can place any file toward the front or back of a disk's data area. See Appendix C for a discussion of this control file and examples.

Partial Defragment Only defragments as many files as possible into empty space without closing up all the empty spaces. This is often the fastest, but tends to promote future fragmentation.

You may wish to use one of the strategies on one day, then use a different strategy on other days. For example, you might use the Directories in Order strategy once a week, and then use the Fragmented Files Last or Speedy Reorganization strategy on other days of the week.

Sorting

Power Disk has a powerful directory sorting utility. You can sort your directory entries in ascending or descending order for one or more of five different criteria: file name, file extension, date created, time created, and file size. You can choose to sort lower level directories, or only the directory you specify. And you can sort in either interactive mode or in batch mode.

Safety Features

Power Disk provides complete data security in case of power failure on a properly operating PC. You can interrupt the operation of Power Disk at any time, then resume it or quit without losing data. Power Disk keeps most memory-resident programs (TSRs) from popping up during reorganization, and prevents accidental reboots or program aborts using the <Ctrl><Alt><Del>, <Ctrl><Break>, or <Ctrl><C> key combinations.

Note: For safest operation, we recommend that you run Power Disk alone, with *no other programs running or resident in memory*. If any other programs access the disk (for instance, to create or delete files) and Power Disk is running, you may get errors. Note that, if it finds it, Power Disk automatically turns off the Super PC-Kwik Disk Accelerator, so you need not disable it yourself. Power Disk re-enables the disk accelerator after finishing.

Analysis

Power Disk provides complete disk file structure analysis. It can find file problems and determine the level of file fragmentation on the disk. Every time Power Disk reorganizes a disk, it performs a quick analysis.

Testing

Power Disk can test your media to find unreliable or marginal disk spots and relocate valuable file data before you lose the data permanently.

Reporting

Power Disk provides optional reports for both analysis and reorganization; they can be sent either to a printer or a disk file. You can also choose to get summary reports only.

PowerScope

PowerScope is available in Interactive mode and provides a map showing the amount and location of file fragmentation. Using PowerScope, you can display file information, highlight a file on the disk map, and show the file's size, attributes, and amount of fragmentation. You can display the contents of the file in ASCII and hexadecimal.

PowerScope is particularly useful on large disks because it allows you to zoom in and display a map of any portion of a disk until you have one-to-one resolution. This gives you more detailed information about disk usage, file contents, and file fragmentation.

For more information on using PowerScope, see Section 5, *PowerScope.*

Automatic Operation

Power Disk works quickly enough that you may wish to run it on a daily basis. The more often you run Power Disk, generally the less work it has to do each time.

Power Disk has several features in Batch mode specifically designed for running automatically from your AUTOEXEC.BAT file, including Conditional Reorganization and Reorganization Scheduling. For more information about Batch mode features, see Section 4, *Using Power Disk in Batch Mode.*

Precautions

Backing Up Disks Be sure to back up your vital disk data before running the Power Disk program for the first time on any disk or partition.

Reliability of Media Before running Power Disk to reorganize a disk or partition for the first time, be sure to check the disk for media errors and then correct them. Often Power Disk can make these corrections. Power Disk provides a disk test that verifies that each location on the disk can be read reliably. To test your disk, select the Testing option from the Interactive main menu. See Section 3 for more information about disk testing.

Using with Terminate and Stay Resident (TSR) Programs Before running Power Disk, be sure that any other background programs, such as disk caches, print spoolers, DOS PRINT, and communication programs have completed their tasks. If you are using a print spooler or buffer that uses disk space to store print data, do *not* specify reports to the printer unless you are sure that the print spooler uses a different disk than that which Power Disk is analyzing or reorganizing. Be sure that no programs are running which could create or delete files while Power Disk is running; for example, a FAX program which answers the telephone and creates a text file.

Warning: Eliminate any possibility that a memory-resident (TSR) program may be activated and used while Power Disk is running! Unload or deactivate them, or reboot without them. Note that it is safe to leave Multisoft's PC-Kwik Power Pak or Super PC-Kwik loaded; if Power Disk finds Super PC-Kwik or any of the Power Pak programs running, it automatically turns them off while Power Disk runs, then turns them back on again when done.

Note: If you are running Power Disk from your AUTOEXEC.BAT file, put the Power Disk commands before any commands to load TSRs other than Super PC-Kwik or PC-Kwik Power Pak. In addition, be sure that no other system can gain access to your disks, as through a network link.

Multitasking Environments Because Power Disk keeps records of the state of the disk file structure and the File Allocation Tables (FATs), Power Disk cannot share the disk being defragmented with any other program or environment, such as Windows or DESQview. *Running any other program at the same time may result in damaged files or directories.*

> **Warning:** Always unload Windows, DESQview or any other program before running Power Disk. Do **not** run Power Disk from within a multitasking environment program!

Restrictions

When running Power Disk, keep in mind the following restrictions:

- A disk must have at least two clusters of free space to be reorganized. For maximum reorganization speed, you need 64K bytes of free disk space.
- If DOS FASTOPEN is installed, you must reboot after reorganizing. (See page 39 for more information.)
- If you use the DOS SUBST or JOIN command, place them after any Power Disk commands in your AUTOEXEC.BAT file. Before using Power Disk interactively, revoke the substitutions and joins. Reboot or use a batch file to set up the substitutions and joins again after you have reorganized your disks. See your DOS manual for details.
- Power Disk cannot run on a disk with a sector size of less than 512 bytes. *Note:* Normal DOS drives do not have a sector size less than 512 bytes, but DOS VDISK can create smaller sector sizes.
- The program cannot run on a disk with a 12-bit FAT if the sector size is greater than 512 bytes (a very large cluster size on a very large disk).

Power Disk Limits

Files and directories on one disk or partition: 32,768
Number of directory levels: 32

Section 3

INSTALLING POWER DISK AND USING INTERACTIVE MODE

Installing Power Disk

The Multisoft installation utility on your distribution diskette sets up the Power Disk files on your disk.

Note: This installation utility overwrites existing files in your \PCKWIK subdirectory unless you choose another subdirectory. If you have previously installed Power Disk, you may want to save any customized files in a different subdirectory so they are not overwritten.

To install Power Disk, place the Power Disk distribution diskette in drive A or B. If you are using drive A type:

```
A:
INSTALL
```

This copies all the files on the distribution disk in drive A to the subdirectory \PCKWIK on your boot disk. Now you can use Power Disk to analyze, test, and reorganize all the disks on your system.

Using Interactive Mode

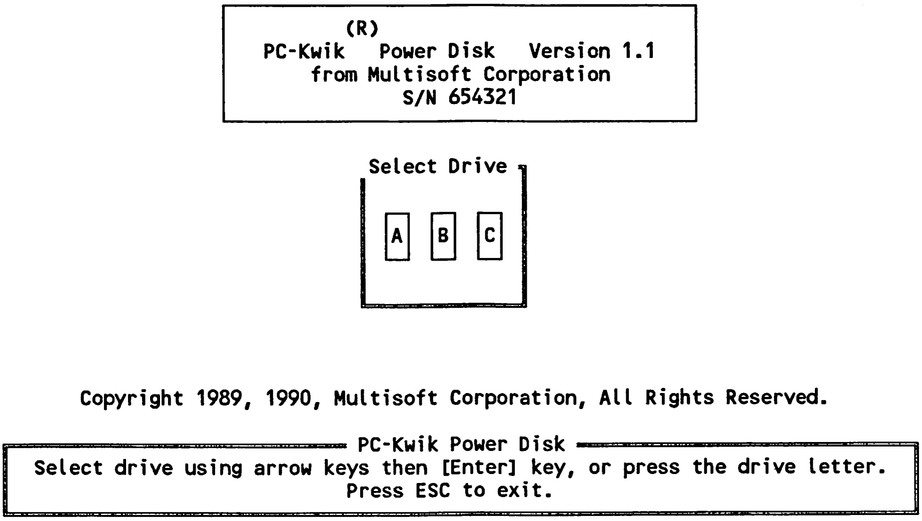
Interactive mode allows you to analyze, test, explore, sort, and reorganize your disk by responding to menu options on the screen. We suggest you use Power Disk in interactive mode to get familiar with the options, then later set up the Batch mode for daily, automatic use.

Warning: *Be sure to back up any disk or partition before you first use Power Disk on that device.* And please read the file named PDSKREAD.ME for any information on hardware or software incompatibilities that became available too late to include in this manual. See Appendix D for information on accessing and reading this file.

To use Power Disk in Interactive mode, at the DOS prompt type:

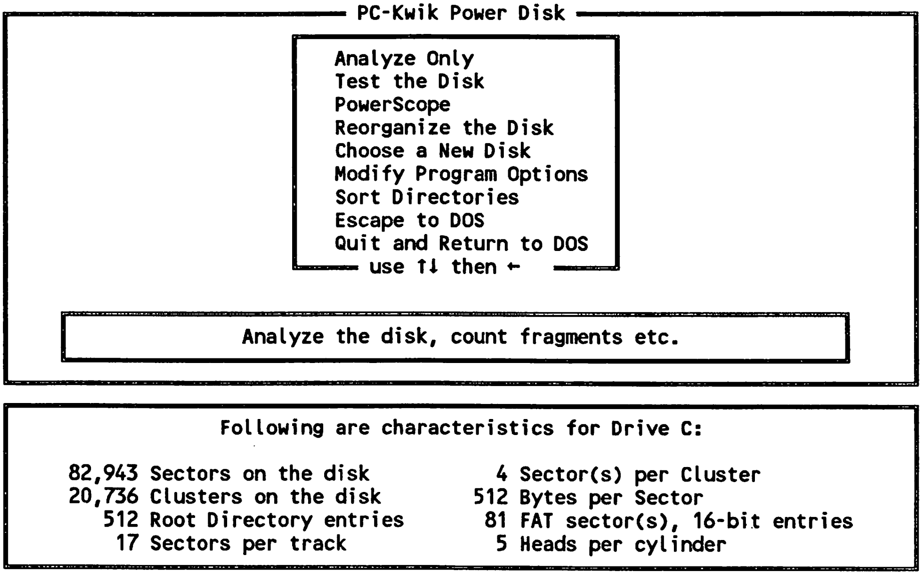
```
PCKPDISK
```

The following screen appears, asking you to enter a drive letter:



```
              (R)
PC-Kwik   Power Disk   Version 1.1
   from Multisoft Corporation
           S/N 654321

         Select Drive
         [A] [B] [C]

Copyright 1989, 1990, Multisoft Corporation, All Rights Reserved.

═══════════════════ PC-Kwik Power Disk ═══════════════════
 Select drive using arrow keys then [Enter] key, or press the drive letter.
                         Press ESC to exit.
```

Move the highlight to the letter of the disk you want to analyze or reorganize, press <Enter> to reorganize the default disk, or point to the disk you wish and click the left mouse button twice. Power Disk does not immediately begin to test or reorganize your disk; it first displays the main menu and a summary of the characteristics of the disk you have selected.



```
                Analyze the disk, count fragments etc.

               Following are characteristics for Drive C:

 82,943 Sectors on the disk             4 Sector(s) per Cluster
 20,736 Clusters on the disk          512 Bytes per Sector
    512 Root Directory entries         81 FAT sector(s), 16-bit entries
     17 Sectors per track               5 Heads per cylinder
```

You can use your mouse or your keyboard to select options in all the menus. When you move the mouse, the highlighting bar moves on the menu. On your keyboard, the arrow keys move the highlighting bar. When the option you want to choose is highlighted, press <Enter> or click the left mouse button. The right mouse button or the <Esc> key takes you back to the previous menu.

You can also select an option by pressing the first letter of the option, whether the option is highlighted or not. For example, pressing R selects the Reorganize the Disk option.

Power Disk displays, below the menu box, a brief description of each option as you highlight it.

Setting Defaults for Interactive Mode

Although you need not provide any parameters to Power Disk when you use it in Interactive mode, you can set default values for the menu options in one of two ways. Either use the appropriate parameter and value when you start Power Disk (the list of parameters available in Interactive mode is found in Section 6) or use the Save Options choice on the Modify Program Options menu to save your selections (see the description of the Modify Program Options menu on page 29.

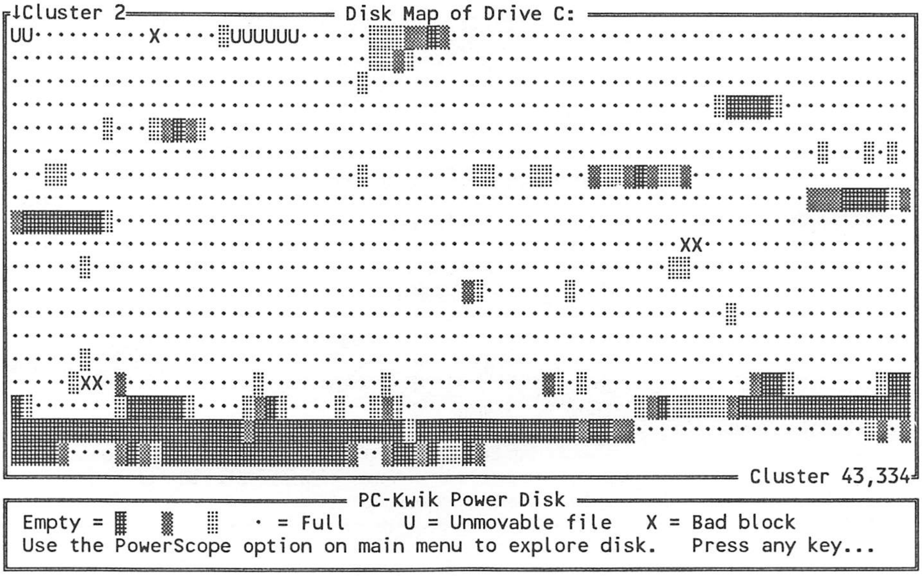
Analyze Only

If you select the Analyze Only option, Power Disk analyzes all the files and directories on the disk you specify and reports on the amount of fragmentation, recommending whether you should reorganize your disk or not.

When Power Disk finishes analyzing your disk, it displays a summary telling you the number of files on your disk, the total number of bytes, the number of fragmented files, and other information about your disk.

```
              PC-Kwik(R)Power Disk   Version 1.1x
                  from Multisoft Corporation
                         S/N 654321
Analyzing Drive C:

     ANALYSIS COMPLETE      --     FRAGMENTATION SUMMARY:

       3,691  Files on the disk, including 153 sub-directories.
  73,580,396  Total bytes used by files and directories.
           8  Fragmented files, including 0 fragmented sub-directories.
       5,473  Clusters ( 10+MB) of empty space in 31 blocks.
          87  % Full.
           2  System files, 5 Hidden files, and 3 Read-only files found.
           5  Unmovable fragments in these special files.
          28  Clusters of bad blocks.

    This Disk is only Slightly Fragmented. It may not need reorganizing.
    Press any key to continue...
```

Press any key to leave the summary. Power Disk displays a map similar to the following Disk Map that shows how the disk data is distributed.

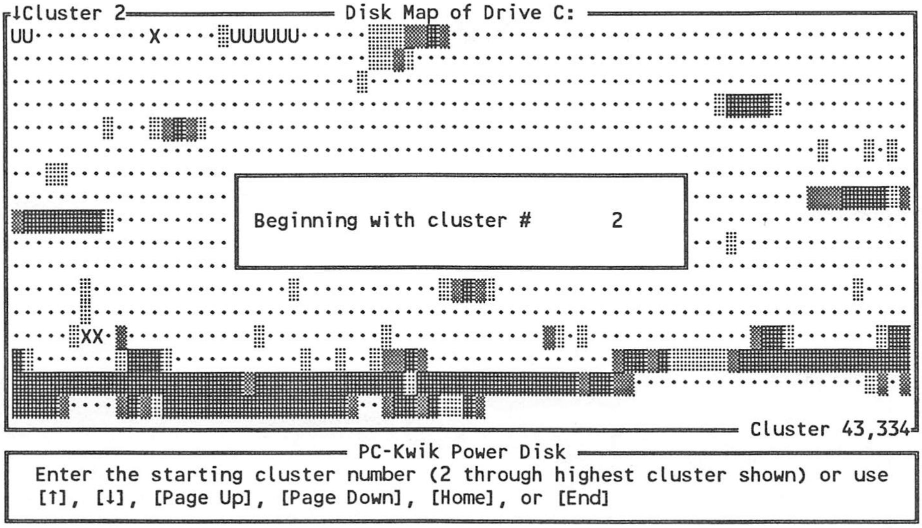


```
↓Cluster 2 Disk Map of Drive C:
UU··········X·····░UUUUUU·····
Cluster 43,334
PC-Kwik Power Disk
Empty = ▓ ▒ ░   · = Full    U = Unmovable file   X = Bad block
Use the PowerScope option on main menu to explore disk.   Press any key...
```

Testing Your Disk

If you choose Test the Disk from the main menu, a disk map displays and you are asked which cluster to begin testing from. The default cluster to start from is cluster 2. Then you can choose how many tests to perform on each cluster. The range is from 1 to 20 tests per cluster. The default is 3. The number of tests is the number of times Power Disk tries to read a cluster before it decides it can't. More tests take more time.

Note: Before reorganizing a disk or partition for the first time, we strongly recommend that you test the disk, performing at least one test per cluster.



Beginning with cluster # 2

Enter the starting cluster number (2 through highest cluster shown) or use [↑], [↓], [Page Up], [Page Down], [Home], or [End]

Selecting one test per cluster is a quick way to ensure that there are no completely unreadable clusters on the disk. Selecting more tests per cluster enables Power Disk to more thoroughly find marginally bad clusters. You may decide to run DiskTest weekly, monthly, or whenever you suspect that you may be having reliability problems.

You can press <Esc> or click the right mouse button at any time to stop the testing, or press the space bar to pause. The disk is never altered during testing without your permission.

When you run DiskTest, Power Disk verifies that the disk media is reliable. It also detects disk areas that may be marginally unreliable. These areas may be readable some of the time, but not others. You may not be aware of these problems because both DOS and the BIOS retry unsuccessful disk operations numerous times, but they don't report these difficulties if the operation succeeds even once. Power Disk notifies you of any disk areas that cannot be correctly read every time.

Bad Blocks

Power Disk does not test clusters that are already marked in the map as Bad Blocks. If Power Disk finds an unreliable cluster, it reports the total number of reads that it attempted and the number of failures. If this cluster is not currently part of a valid file, you have the option to mark it as a Bad Block, preventing DOS from using it in the future for file data. We recommend marking such blocks as bad.

If Power Disk reports an unusually large number of bad blocks, especially if you are analyzing the disk for the first time, your disk may be error-prone, there may be an incompatibility between your disk and the Power Disk program, or your disk may have serious problems requiring more to correct it than simply marking bad blocks.

Readable File Clusters

Readable, but unreliable, file clusters are clusters that can be successfully read at least once and also fail to be read at least once. If Power Disk finds a readable but unreliable cluster that is part of a valid file, it reports the name of the file, the cluster number, and how many times it failed. You can choose to have Power Disk relocate the file data to an empty disk area and mark the previous area as a Bad Block. Power Disk tests the new area to ensure its reliability and compares the data moved to ensure nothing was lost.

Unreadable File Clusters

Unreadable file clusters are clusters with data that cannot be read at all. Power Disk gives you the option to relocate these clusters, although some or all of the data may be lost. You may choose to relocate unreadable clusters that are part of a valid file because Power Disk may be able to read and restore some parts of this cluster. Although some data in the cluster may be lost, you may still be able to gain access to the file data that follows the bad cluster.

Note: This data is probably lost already. Power Disk attempts to save as much data as possible.

Typically you should remap clusters that have two or more failures. However, avoid remapping too many clusters on a disk or you'll soon limit the amount of usable space on that disk. A disk that has a great number of errors reported may be error-prone, or there may be an incompatibility between the test program and your system.

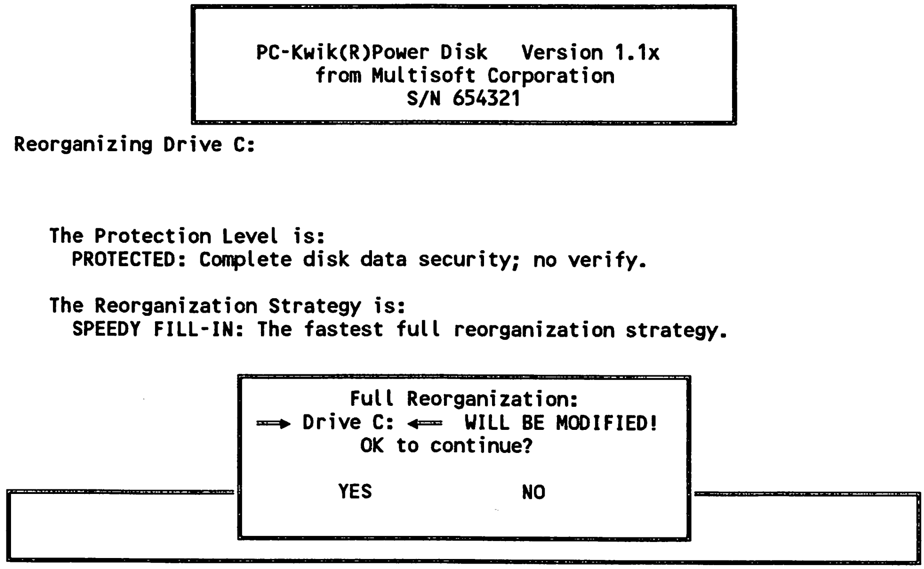
When attempting to relocate data, Power Disk does not move an unmovable file without your permission. You can specify that hidden and read-only files are movable by selecting the File Handling Options from the Modify menu.

PowerScope

PowerScope gives you a graphical representation of your disk usage and file fragmentation and lets you see the contents of files. See Section 5 for compete information on using PowerScope.

Reorganize the Disk

Selecting the Reorganize the Disk option tells the program to reorganize the files and directories on the disk you specify. Before beginning, Power Disk performs a complete analysis of the disk and displays the protection level and strategy selection that are in effect.

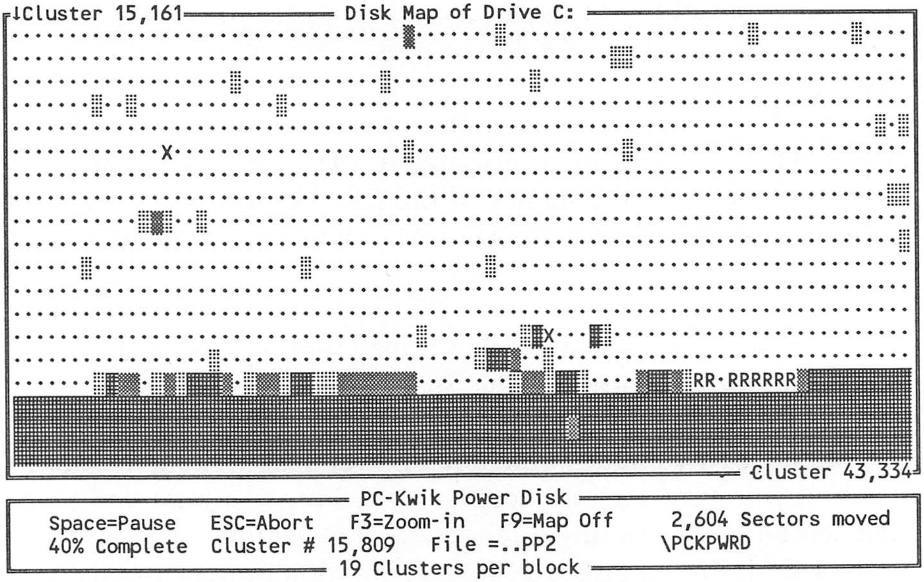


```
                 PC-Kwik(R)Power Disk   Version 1.1x
                     from Multisoft Corporation
                             S/N 654321

Reorganizing Drive C:


   The Protection Level is:
     PROTECTED: Complete disk data security; no verify.

   The Reorganization Strategy is:
     SPEEDY FILL-IN: The fastest full reorganization strategy.

                          Full Reorganization:
                   ==> Drive C: <== WILL BE MODIFIED!
                            OK to continue?

                         YES               NO
```

You can change these options from Modify Program Options in the main menu at any time before you start reorganizing. You must verify you want to modify the disk before Power Disk starts its reorganization.

While Power Disk is reorganizing your disk in interactive mode, it displays a dynamic Disk Map that shows on your screen the movement of file data on the disk. The R characters show reading and the W characters show writing. Power Disk highlights in a different color or in reverse video the portion of the disk that is already reorganized. This gives you a good idea of where data movement occurs. Note that even though you often see both R and W characters on the map at the same time, Power Disk is not doing both functions simultaneously.

A sample map is shown below. It represents a reorganization which is 40% complete and which has been zoomed to show the disk from cluster 15,161 to cluster 43,334.



```
                                  PC-Kwik Power Disk
   Space=Pause    ESC=Abort    F3=Zoom-in    F9=Map Off       2,604 Sectors moved
   40% Complete   Cluster # 15,809   File =..PP2              \PCKPWRD
                                 19 Clusters per block
```

Zooming

You can zoom in on the map by pressing the <F3> key during reorganization. Power Disk allows you to zoom in only on those areas that have not yet been reorganized. You can tell if the map has been zoomed by looking in the upper left corner of the map for the starting cluster number. If it is larger than 2 then you have a zoomed view.

Each time you zoom, Power Disk tries to double the resolution. If it cannot, it tries an intermediate resolution. If that fails, a beep sounds and the display remains unchanged.

To zoom out after you have zoomed in, press either <F8> to return to the top-level display or press <F4> to zoom out one level at a time.

Power Disk provides an alternative to the graphic Disk Map display, which lists the names of the files being moved. Press <F9> to switch between the Disk Map and the file name list displays.

You can stop the reorganization at any time by pressing <Esc>. You can pause by pressing the Space bar.

If you are also running Multisoft's Power Pak Screen Accelerator and you have screen blanking turned on, you may find that the screen blanks during a lengthy reorganization. Because Power Disk intercepts most keys so you don't inadvertently reboot or access the disk while a reorganization is taking place, the only key you can use to restore your screen is the left-hand <Shift> key.

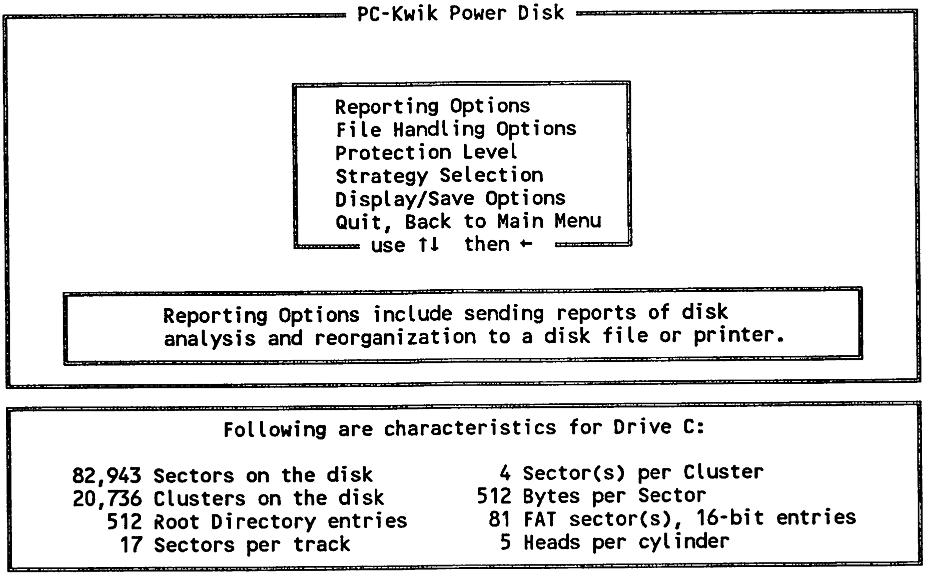
When Power Disk finishes reorganizing, it displays a summary of the changes it made to your disk. You can choose to send this summary to a line printer or to a file by selecting the appropriate options in the Reporting Options submenu from the Modify Program Options menu before reorganizing.

Choose a New Disk

The Choose a New Disk option returns you to the first screen you saw when you loaded Power Disk. Point to the new disk drive letter from those displayed and press <Enter> or click the left mouse button twice to choose it. The main menu displays and you can analyze, test, reorganize, or sort the new disk.

Modify Program Options

Selecting Modify Program Options allows you to select options you may wish to modify:



```
                         PC-Kwik Power Disk

                    Reporting Options
                    File Handling Options
                    Protection Level
                    Strategy Selection
                    Display/Save Options
                    Quit, Back to Main Menu
                       use ↑↓  then ←

        Reporting Options include sending reports of disk
        analysis and reorganization to a disk file or printer.

                Following are characteristics for Drive C:

   82,943 Sectors on the disk            4 Sector(s) per Cluster
   20,736 Clusters on the disk         512 Bytes per Sector
      512 Root Directory entries        81 FAT sector(s), 16-bit entries
       17 Sectors per track              5 Heads per cylinder
```

Choose one of the items on the menu and a new display shows what you have chosen and what other options you have available for that item. The instructions for each menu tell you how to select the different options.

You can also save the new options you have chosen so they become your default options the next time you use Power Disk. When you save your choices, they are written to a file called PCKPDISK.CFG in the directory that Power Disk is executed from, usually PCKWIK. This file is an editable ASCII file.

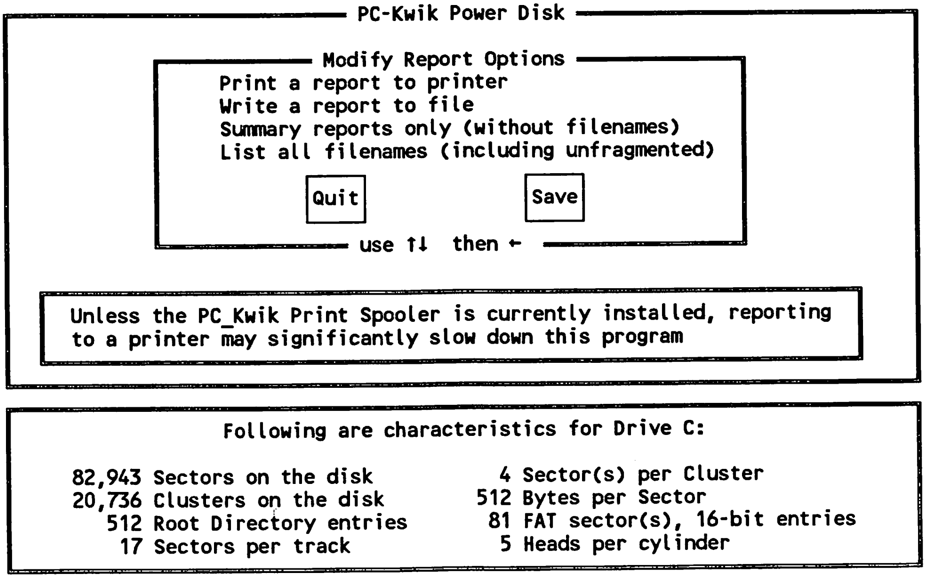
In some menus, you can choose more than one option. In these menus, highlight the options you want and press <Enter> or click the left mouse button. A check mark appears next to the option to show that it is selected. Then choose Save to save your choices and return to the Modify Options main menu. Or choose Quit to return to the Modify Options menu without making any changes.

In other menus, you can only choose one of the possible options. In these menus, once you have chosen you immediately return to the Modify Options main menu and the highlighted item is selected.

All the options that you set interactively can also be set in Batch mode. See Section 4 for more details on using Batch mode to run Power Disk.

Reporting Options

When you select Reporting Options, you can choose one or both of Print a report to printer and Write a report to file. If you choose one of these two options, you can then also choose whether the report is only a summary or whether it includes all filenames.


PC-Kwik Power Disk
Modify Report Options
Print a report to printer
Write a report to file
Summary reports only (without filenames)
List all filenames (including unfragmented)
Quit
Save
use ↑↓ then ←

```
Unless the PC_Kwik Print Spooler is currently installed, reporting
to a printer may significantly slow down this program
```

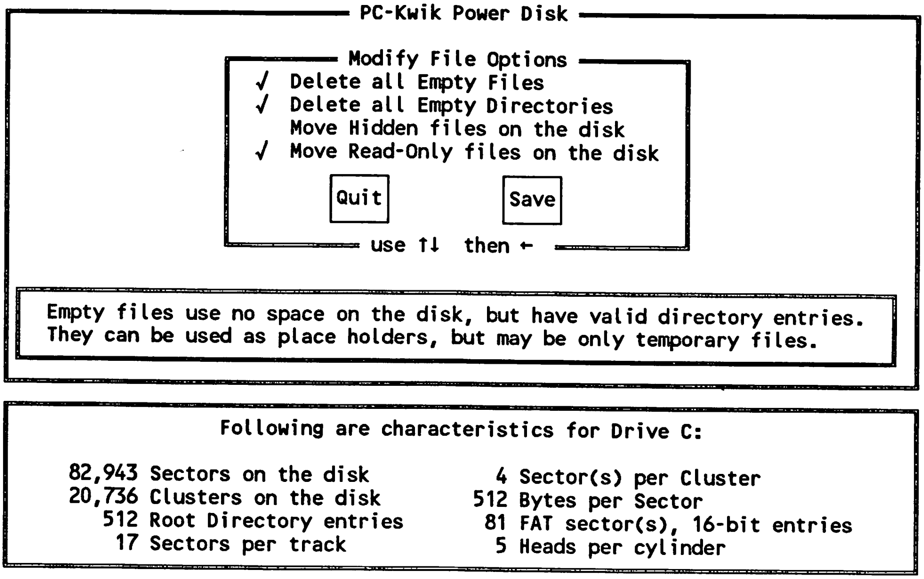
```
                Following are characteristics for Drive C:

82,943 Sectors on the disk               4 Sector(s) per Cluster
20,736 Clusters on the disk            512 Bytes per Sector
   512 Root Directory entries           81 FAT sector(s), 16-bit entries
    17 Sectors per track                 5 Heads per cylinder
```

- *Print a report to the printer* If you choose to send the report to a printer, you must choose which printer port to use. The default printer port is LPT1. You can specify any port from LPT1 to LPT3.
- *Write a report to file* If you choose to write the report to a file, you must choose the drive letter for the report file; it must be a different drive than the one you are reorganizing. *Note:* Sending a report file to a diskette can substantially slow reorganization.
- *Summary reports only (without filenames)* Creates a summary report of the reorganization which does not list the names of the files that were moved; the report is sent to a disk or to a printer, depending on which option you chose.

— *List all filenames (including unfragmented)* Creates a complete directory tree of files on your disk and send the report to a disk or to a printer, depending on which option you chose.

File Handling Options

Choose as many file handling options as you wish from this screen:

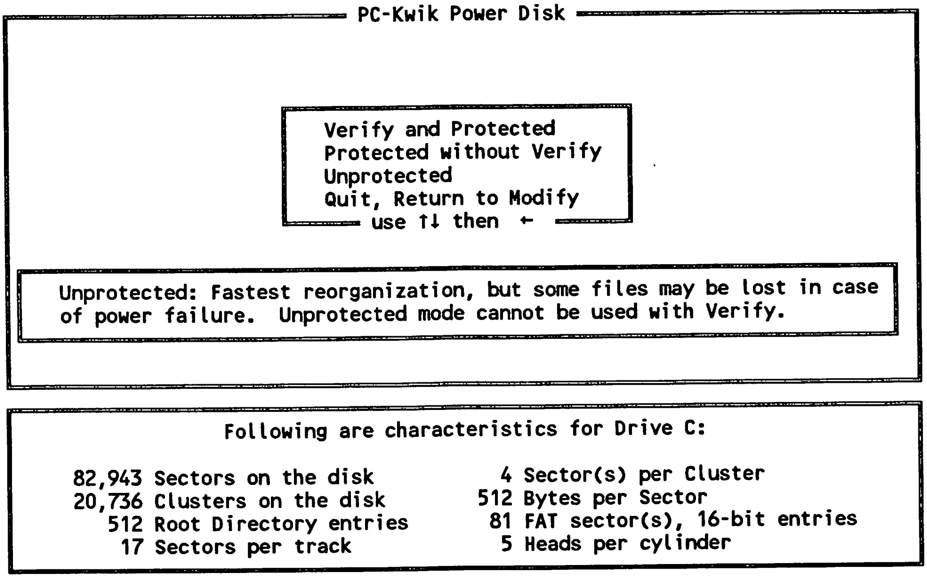


```
                         PC-Kwik Power Disk

                        Modify File Options
                  √  Delete all Empty Files
                  √  Delete all Empty Directories
                     Move Hidden files on the disk
                  √  Move Read-Only files on the disk

                          Quit         Save

                         use ↑↓  then ←

   Empty files use no space on the disk, but have valid directory entries.
   They can be used as place holders, but may be only temporary files.

                Following are characteristics for Drive C:

     82,943 Sectors on the disk               4 Sector(s) per Cluster
     20,736 Clusters on the disk            512 Bytes per Sector
        512 Root Directory entries           81 FAT sector(s), 16-bit entries
         17 Sectors per track                 5 Heads per cylinder
```

By default, Power Disk does not automatically delete empty files or directories or move hidden or system files. It does, by default, move read-only files.

Protection Level Options

You can choose one of the following protection levels:

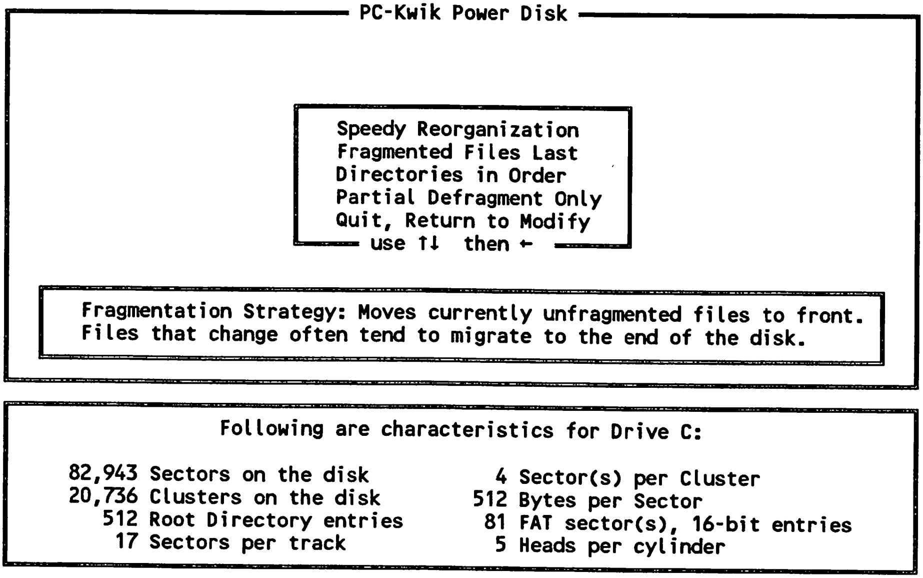


```
                         PC-Kwik Power Disk

                    Verify and Protected
                    Protected without Verify
                    Unprotected
                    Quit, Return to Modify
                          use ↑↓ then ←

  Unprotected: Fastest reorganization, but some files may be lost in case
  of power failure.  Unprotected mode cannot be used with Verify.

                 Following are characteristics for Drive C:

   82,943 Sectors on the disk              4 Sector(s) per Cluster
   20,736 Clusters on the disk           512 Bytes per Sector
      512 Root Directory entries          81 FAT sector(s), 16-bit entries
       17 Sectors per track                5 Heads per cylinder
```

- *Verified and Protected* Power Disk reads each disk write again and compares it to the original data. The data is fully protected against power loss or system crash.
- *Protected without Verify* The data is fully protected against power loss or system crash, but Power Disk does not read and compare the data after writing. This is the default.
- *Unprotected* The data is neither protected nor verified. It provides faster reorganizing and can be used when no power failure is likely. In the case of a power failure or system crash, some files may be lost.

Strategy Options

You can choose one of the following reorganization strategies:



```
                         PC-Kwik Power Disk

                    Speedy Reorganization
                    Fragmented Files Last
                    Directories in Order
                    Partial Defragment Only
                    Quit, Return to Modify
                        use ↑↓  then ←

   Fragmentation Strategy: Moves currently unfragmented files to front.
   Files that change often tend to migrate to the end of the disk.
```

```
                Following are characteristics for Drive C:

   82,943 Sectors on the disk              4 Sector(s) per Cluster
   20,736 Clusters on the disk           512 Bytes per Sector
      512 Root Directory entries          81 FAT sector(s), 16-bit entries
       17 Sectors per track                5 Heads per cylinder
```

- *Speedy Reorganization* All empty spaces are closed up by moving as few files as possible with no particular file order. This is the default and the fastest complete defragmentation.
- *Fragmented Files Last* Places currently fragmented files at the end of the disk data area and the non-fragmented files at the front. This strategy leads to less fragmentation and quicker defragmentation.
- *Directories in Order* Places files on the disk in the existing order of the directories under DOS. Specific files or groups of files can be placed toward the front or back of each disk's

data area using a configuration file, usually named PCKPDISK.FIL. See Appendix C.

Note: The default for Directories in Order is to place all of the files in the order implied by the root directory and its subdirectories. This order can be changed by using the Sort Directories utility on the main menu.

- *Partial Defragment Only* Tries to defragment as many files as possible into empty areas without closing up the empty spaces. If Power Disk cannot defragment all the files, you can choose to stop defragmenting or to continue with the Speedy Reorganization strategy.

Hints on Selecting a Strategy

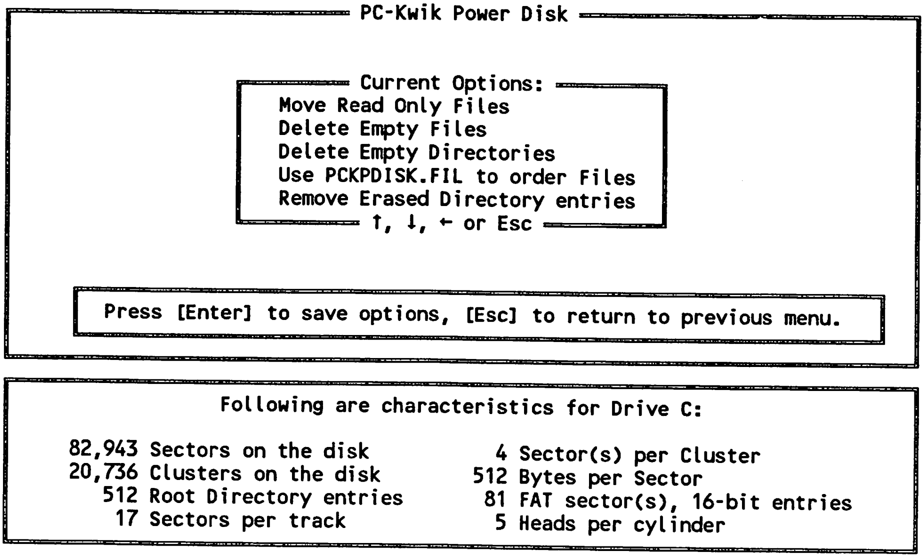
If you work on databases or other large files that change often, or if many of your frequently used directories contain both non-fragmenting files and fragmenting files, the Fragmented Files Last strategy is probably best.

You can use the Directories in Order strategy in several ways. You can specify that directories containing files that should never become fragmented (such as executable files) be placed at the front of the disk. You can specify that directories you use most frequently be placed at the front of the disk. Or you could place specific files that you do not expect to fragment toward the front and files you do expect to fragment toward the back.

Unless you are familiar with the applications you are using and you want to spend the time to place specific files on the disk, we recommend reorganizing daily with Speedy Reorganization and once a week using Fragmented Files Last.

Display/Save Options

You can display the current set of options you have chosen and save them, if you wish, to a configuration file. If you choose Display/Save Options, you see a screen like this:



```
PC-Kwik Power Disk

              Current Options:
              Move Read Only Files
              Delete Empty Files
              Delete Empty Directories
              Use PCKPDISK.FIL to order Files
              Remove Erased Directory entries
                    ↑, ↓, ← or Esc

    Press [Enter] to save options, [Esc] to return to previous menu.

               Following are characteristics for Drive C:

     82,943 Sectors on the disk            4 Sector(s) per Cluster
     20,736 Clusters on the disk         512 Bytes per Sector
        512 Root Directory entries        81 FAT sector(s), 16-bit entries
         17 Sectors per track              5 Heads per cylinder
```

Pressing <Esc> returns you to the Modify Options menu without saving any changes. Use the arrow keys to scroll through the list of options if the list is too long to show in the display window.

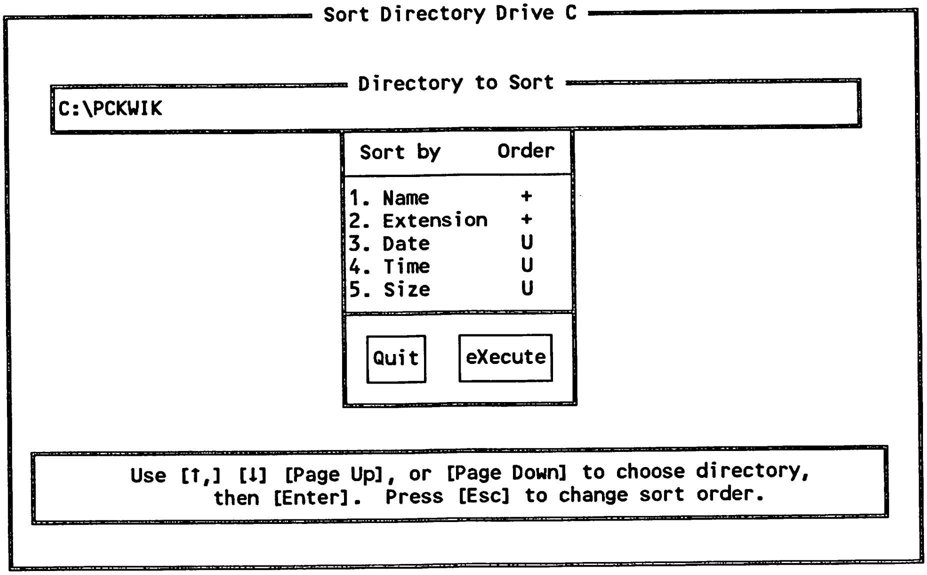
Pressing <Enter> saves the options you have chosen to a configuration file. The next time you use Power Disk in either Batch or Interactive mode, these options are the default.

The configuration file is created in the subdirectory which contains the Power Disk executable file, usually /PCKWIK. The file is named PCKPDISK.CFG. The configuration file is an ASCII file that you can edit and change by hand if you like. See Appendix D for information on editing ASCII files.

Sort Directories

You may wish to have your directory entries sorted. DOS does not usually sort entries in any order. When you choose Sort Directories from the main menu, Power Disk sorts the directory entries for you. You can choose which directories to sort, whether to sort directory levels under the one you have chosen, what fields to sort by, and for each field, whether to sort in ascending or descending order or not to sort by that field at all.

When you choose Sort Directories, the following screen appears:



```
Sort Directory Drive C

Directory to Sort
C:\PCKWIK

Sort by        Order

1. Name          +
2. Extension     +
3. Date          U
4. Time          U
5. Size          U

Use [↑,] [↓] [Page Up], or [Page Down] to choose directory,
     then [Enter].  Press [Esc] to change sort order.
```

The cursor begins in the box which tells Power Disk what directory to sort. Use the up and down arrows and the Page Up and Page Down keys to scroll through the directories on the disk. The up and down arrows move through all levels of directories. The Page Up and Page Down keys move through directories at the same level. Use the <Enter> key or click the left mouse button to choose the directory to sort. Or type in the name of the directory you want.

If you want to sort your whole disk, choose to sort the top-level directory. When you clik on eXecute, you are asked whether lower-level directories should also be sorted. Choose to sort lower-level directories too, and your whole disk is sorted.

The sort criteria are listed below the directory name. Power Disk sorts your files by the criteria in the order you see on the screen: first by criterion 1, then by criterion 2, third by criterion 3, and so on. You can rearrange the order of the sort criteria by choosing a field and then pointing to the place you want to move it to. For instance, if you want Name to be the third sort criteria, point to Name, choose it, then point to the third line. Name moves to the third line and Extension and Date move up.

You can point and choose with either the keyboard arrow and <Enter> keys or the mouse.

When you select one of the criteria, you can choose whether Power Disk sorts in ascending order, in descending order, or does not use that criterion to sort at all. Type + to sort in ascending order. Type - to sort in descending order. Type U to choose that your directory not be sorted with this criterion. You can also point to the +/-/U field and click the left mouse button to cycle through the three options.

When you have chosen the directory to be sorted and the criteria to sort it by, type X or click on eXecute to begin the sorting. Power Disk asks you if you want to also sort lower-level directories under the chosen directory.

When the sorting is done, you may wish to escape to the DOS prompt to see the results of the sort. Sorting is particularly powerful if you have chosen the Directories in Order reorganization strategy.

Escape to DOS

When you choose Escape to DOS from the main menu, Power Disk brings up a DOS shell where you can execute DOS-level commands. When you are ready to return to Power Disk, type Exit.

When You Are Done

When you are finished using Power Disk interactively, select Quit and Return to DOS from the main menu. If you reorganized your disk and are using DOS 3.3 or later, Power Disk displays a message warning you that your disk has been modified. DOS versions 3.3 and later contain FASTOPEN, a special-purpose disk cache. If you are running FASTOPEN, be sure to reboot your system to prevent DOS from using obsolete directory information. We recommend using Multisoft's Super PC-Kwik Disk Accelerator rather than DOS FASTOPEN for better performance and compatibility with Power Disk.

Section 4

USING POWER DISK IN BATCH MODE

Introduction

Batch mode commands allow you to run Power Disk from a batch (.BAT) file or from the DOS command line with no operator interaction. The program is controlled by parameter values included with the Power Disk command in a batch file. The options selected interactively in the Modify Options menu and saved to the PCKPDISK.CFG file also apply whenever you use Batch mode. See Appendix D for information on creating and editing batch files.

If you have not yet installed Power Disk, see the beginning of Section 3 for instructions to do so.

For a complete list of parameters available in Batch mode, see Section 6.

Running in Batch Mode

To run Power Disk in Batch mode, you must include either the /R, the /Z, the /T, or the /A parameter with the command. The /R parameter analyzes and then reorganizes a disk drive. The /A parameter analyzes a disk drive. /Z sorts the directories on your disk, and /T tests the disk. Note that these parameters are mutually exclusive. You cannot use more than one of them in one command line; you must use separate batch commands.

For example:

```
PCKPDISK /R:C
```

tells Power Disk to run in Batch mode and to reorganize drive C. If default options you saved in the PCKPDISK.CFG file are different from the program defaults, the default values you saved apply, in addition to the options you specify on the command line.

Screen Output

You can specify that there be no screen output for Batch mode by using the /Y- parameter. Power Disk runs, but does not send any messages to the screen. You are able to abort the program at any time by pressing <Esc>, but the program does not send a confirming message to the screen.

Other parameters force certain color schemes or monochrome displays. If you don't specify these options, Power Disk determines what is appropriate given your hardware configuration. See Section 6 for a complete list of the parameters available.

Strategies for Reorganization

Power Disk allows you to choose from several reorganizing strategies. The strategies are listed below with the control parameter you use in Batch mode shown in parenthesis.

- *Speedy Reorganization* (/S:S) is the fastest complete defragmentation. All empty spaces are closed up by moving as few files as possible.

- *Fragmented Files Last* (/S:F) places currently fragmented files at the end of the disk with non-fragmented files at the front.
- *Directories in Order* (/S:D) places files on the disk in the existing directory order. See Appendix C for information on the file PCKPDISK.FIL which can be used to specify which files you would like placed toward the front or back of the disk's data area when running in Batch or Interactive mode.
- *Partial Defragment Only* (/S:P) defragments as many files as possible without closing up the empty space on the disk.

Automatic Operation

In Batch mode, Power Disk provides several ways to reorganize automatically, including Conditional Reorganization based on fragmentation level and day of the week. Automatic operation features are most useful when you place the Power Disk command in your AUTOEXEC.BAT file.

Conditional Reorganization

Conditional Reorganization runs Power Disk only when a disk or partition has reached a certain state of fragmentation. You can use the optional fragmentation level value, *n*, following the standard /R:*d* command, to specify the level of fragmentation.

/R:*dn* Reorganize drive *d* when the level of fragmentation reaches level *n*. *N* may be any integer between 0 and 4:

0 Always attempt to reorganize the disk.
1 Reorganize if 1-6% of the disk is fragmented (slightly fragmented disk).

2 Reorganize if 6-16% of the disk is fragmented (moderately fragmented disk).
3 Reorganize if 16-33% of the disk is fragmented (significantly fragmented disk).
4 Reorganize if 33% or more of the disk is fragmented (very badly fragmented disk).

Default: /R:*d*0. There is no default for the disk drive, a target drive must be designated.

Once-a-Day Scheduling

You can also schedule Power Disk to run your reorganization once each day. By including one of these control parameters in your batch file, you reorganize your disk only once a day, no matter how many times you run the batch file. If your Power Disk commands are in your AUTOEXEC.BAT file, Power Disk runs once a day regardless of how often you reboot your system.

/IF Reorganize the disk only if this is the first time today that Power Disk has been run on this drive with the /IF parameter. When you use /IF, Power Disk keeps a record for each drive in the file PCKPDISK.DAT. Power Disk checks this file each time it runs. If Power Disk has already run on that drive, it does not run again that day.

Power Disk creates the PCKPDISK.DAT file if it does not already exist. If the file does not contain valid information, Power Disk displays a message and runs, ignoring /IF. Both PCKPDISK.DAT and the Power Disk program should be in the \PCKWIK subdirectory.

Default: None

/IR:*d*	Reset the PCKPDISK.DAT file so it appears as if Power Disk has not been run today on drive *d*. Specifying /IR without a drive letter resets all drives at once. Default: None

Day-of-the-Week Scheduling

You can schedule Power Disk to run on specific days of the week.

/I:*n*	Reorganize only if today matches the specified days of the week. *N* may be any number between 1 and 7. 1 indicates Sunday and 7 indicates Saturday. You may specify up to 7 days, separating each number by a comma, space or colon, or using no separator. For example:

/I:7	Reorganize if today is Saturday
/I:2,4,6	Reorganize if today is Monday, Wednesday, or Friday
/I:13456	Reorganize if today is any day except Monday or Saturday

Default: /I:1234567

Using More Than One Conditional Test

If you use both /IF and /I:*n* in the same command line, Power Disk always performs the test for Day-of-the-Week Scheduling first, regardless of the order in which the parameters appear in the command line.

If today is not one of the specified days, Power Disk does not test for first-time use, and the PCKPDISK.DAT file is not changed.

If you use both /IF and /R:*dn*, Power Disk always test for first-time use and the PCKPDISK.DAT file is changed, regardless of whether the level of fragmentation is high enough for reorganization.

Directory Sorting

You can use Power Disk in Batch mode to sort your disk directories. You cannot do an Analyze (/A), Reorganize (/R) or Test (/T) at the same time you sort directories.

/ZL*fop* Sort the directory with path *p* and sort lower-level directories also. If you do not use L, only the current level directory is sorted.

F is the field to sort by. You can specify any or all of the four options. The first option you give is the primary sort field; files are sorted by this field first. The second is the secondary sort field. Files are then sorted in order of this field, and so on. *F* is one or more of:

N	file name
E	file extension
T	date and time
S	file size

O specifies the sort order. There is one sort order for each sort field. It must come directly after the field, and you can have up to four field/order pairs in each sort command. *O* is one of:

+	for ascending order
-	for descending order
U	for unsorted

P must be a complete path, including the drive specifier (letter and colon). You must use a \ after the drive specifier unless you wish to sort the current directory.

<u>Default:</u> If no drive is specified, the current drive is the default. If no path is specified and \ is not included, the current directory is sorted. If no sort field is specified, the default is to sort first by Name and then by Extension. If no order is specified for a particular sort field, the default is ascending order.

Examples

Example 1:

```
PCKPDISK /R:C /S:D /IF /I:36
PCKPDISK /R:C /IF /I:12457
```

Meaning: Reorganize drive C, only once per day on Tuesdays and Fridays using the Directories in Order strategy; use the default Speedy Reorganization strategy only once per day on the other days of the week.

Example 2:

```
PCKPDISK /ZLT+N-C:\DIR1
```

Meaning: Sort the directory DIR1 on drive C:, and its lower-level directories. Sort by date/time in ascending order and by name in descending order.

Section 5

POWERSCOPE

Introduction

PowerScope in Interactive mode gives you detailed information about disk usage and file fragmentation. PowerScope also allows you to quickly pinpoint a specific file, empty space, or bad block by location, cluster number, or file name and look at the contents of any location on your disk.

This chapter tells you how to move around in PowerScope, how to move from one level of resolution to another, how to display information about files, directories, and disk fragmentation, how to find where specific files and directories are located on the disk, and how to save reports and screen displays. At the end of this chapter is a summary of the function keys available in PowerScope.

What is a Cluster?

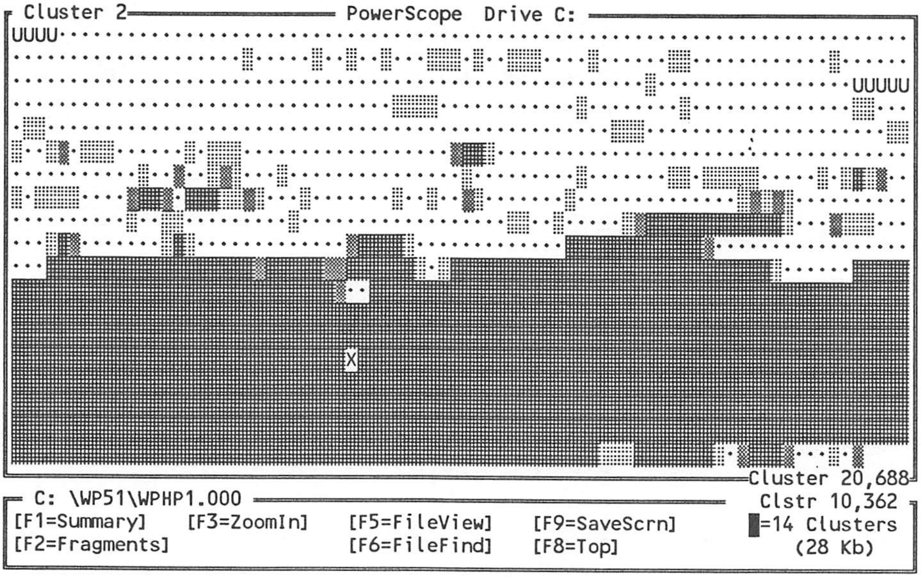
A cluster is the smallest unit of disk file allocation. Even the smallest file, containing only a few bytes, is allocated an entire cluster of disk space. No single cluster can be used by more than one file. As each file grows, disk space is allocated to it in units of one cluster. We use the cluster as the unit to display disk usage.

The actual size of one cluster is determined when the disk is originally formatted. Cluster size is always a multiple of the disk sector size, but the sector size and the number of sectors in one cluster can vary from disk to disk. The main menu shows you this information for the disk you are testing or reorganizing.

The disk map displayed by the PowerScope shows the disk in terms of clusters. The top-level map of the entire disk shows all the clusters on your disk, beginning with cluster 2. Your disk can also be described in terms of tracks and sectors. See the *Glossary*, Appendix E, for definitions of the terms used to describe disk space allocation.

Display Features and Map Resolution

Selecting PowerScope from the main menu displays a disk map which shows an overview of disk usage and fragmentation. This is an example of PowerScope's initial display.



PowerScope's top-level map of the entire disk may have a very low resolution, with one small rectangular block on the screen representing many disk clusters. Each block in this example represents 14 clusters.

PowerScope displays the state of the block (empty to full) by graduating from shaded blocks (▦ empty) to solid blocks with a single dot (· full). If all of the clusters represented by any single block on the screen are used, the block is marked full. If all of the clusters are empty, the block is marked empty. Blocks are also marked as mostly full or mostly empty. PowerScope marks bad blocks with an X and unmovable blocks with a U.

Navigating Around the Map

You can use the keyboard or the mouse to move around the disk map displayed by PowerScope. The arrow keys move the cursor around from block to block on the map. Press the function keys to zoom in and out, display files, find files, or send reports to the printer. (The functions keys are described in more detail later in this chapter.) Functions that apply to a specific cluster apply to the cluster highlighted by the cursor.

You can also access these functions by pointing with your mouse to the function key in the menu bar at the bottom of the screen and clicking inside the square brackets for the function key that does what you need. In this chapter, when we tell you to press a function key you can also click on the menu bar.

When you use the mouse to move the cursor you must click on the cluster you want to highlight, moving the cursor to the mouse. Click again to pick up the cursor if you want to move the cursor around the screen with the mouse. Or move the mouse to a new cluster and click to jump the cursor to the mouse. Doubleclicking after you pick up the cursor zooms in on the cluster chosen.

The cluster number and file name display in the menu bar under the map so you know where the cursor is at all times. These names change as you move the cursor with the mouse or the arrow keys.

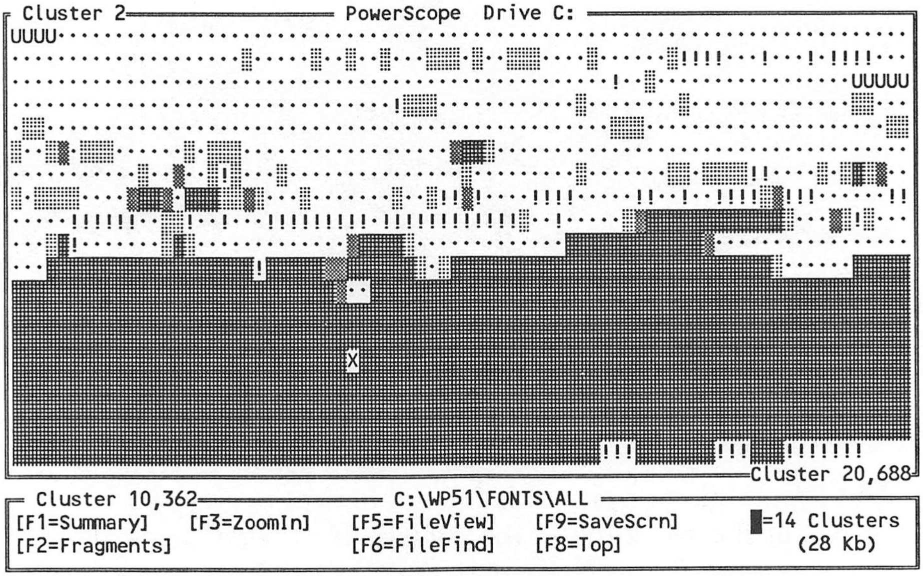
Zooming

PowerScope allows you to zoom in on the map so you can see the disk in as much detail as you need, up to a one-to-one resolution (one block representing exactly one cluster). At this level, the map is completely accurate, and there is no need for any display approximations such as mostly full. Press <F3> to zoom in and <F4> to zoom out. Pressing <F8> while viewing the disk map always takes you to the top level view. The bounds of each map (in cluster numbers) are shown at the upper left and lower right corners.

You can also zoom in and out using the mouse; use the left button to click on one cluster, moving the cursor to the mouse, then click again until the display zooms in. To zoom back out, click the right button.

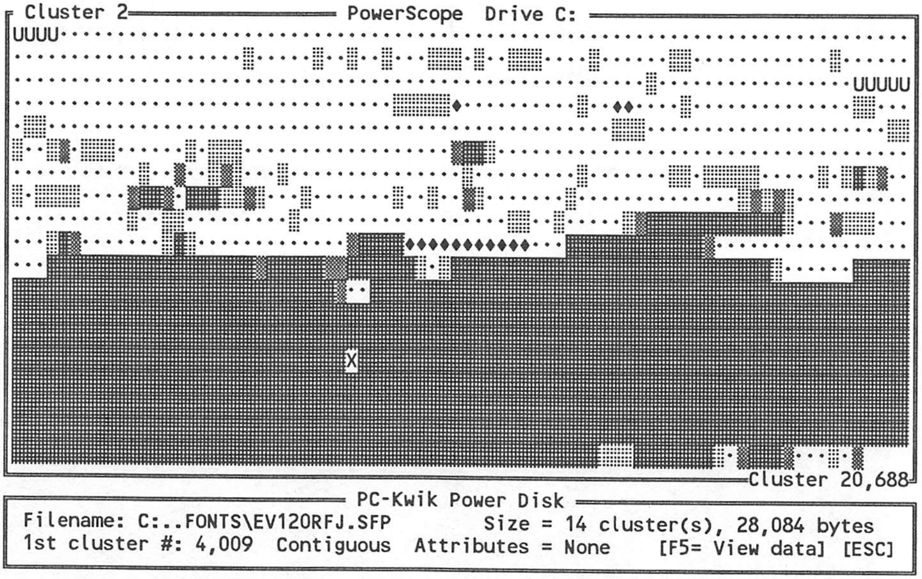
Displaying Fragmentation

Displaying those portions of the current map that contain fragmented files gives a pictorial representation of the amount and location of file fragmentation. Press <F2> to display fragmented files, which are shown as exclamation marks (!).



Displaying Files

Use the arrow keys or mouse to move the cursor around on the disk map. PowerScope dynamically shows the number of the cluster under the cursor and the name of the file which uses that cluster. Press <F5> (FileView) to display information on the file whose cluster is currently under the cursor, showing its size, attributes, and the amount of fragmentation. PowerScope highlights all blocks containing even one cluster of the file with the character ♦.



```
Filename: C:..FONTS\EV120RFJ.SFP        Size = 14 cluster(s), 28,084 bytes
1st cluster #: 4,009  Contiguous  Attributes = None     [F5= View data] [ESC]
```

The information displayed is for the file containing the first cluster of the block under the cursor. If the first cluster is empty or bad, PowerScope uses the first valid file cluster in the block. No action is taken if there are no valid file clusters in the block.

Press <F5> again to display the contents of the file, shown in both hexadecimal and ASCII format. Press <Esc> to return to the main PowerScope menu.

Finding a File

PowerScope can find a file by name and display its file information. When you press <F6>, FileFind prompts you to enter a file name. Enter only a single file name, not the whole file path.

FileFind uses wildcards, but only in specific combinations. In the allowed combinations listed below, *x* and *y* represent any alphanumeric character; *x* characters are used for the filename and *y* for the extension. ? is a placeholder for any single unknown character and * is a placeholder for any string of unknown characters.

xxx.*
xxx*.*
*.yyy
xxx*.yyy
.
xxx?.*
xxxx.y??
?xxx.*
*.?yy

These combinations are invalid and are ignored:

*xx.yyy
xx.

FileFind searches the entire disk for a matching filename. When it finds a match, it asks you if you want to display it. If you answer Y, FileFind displays the file information and continues searching for any other matching filename on the disk. If you answer N, the search continues without displaying a file.

Pressing <Esc> at the question or during a file display stops the search. Pressing S suppresses the questioning. FileFind then displays the information on all further matching files, one file at a time, without asking. If you press A, FileFind displays on the map the locations of all subsequent files that match the requested pattern.

If FileFind finds more than one file of the same name on the disk, it reports and displays each of them.

The last file actually displayed by FileFind becomes the currently displayed file. However, after a display of all matching files, the map is redrawn with no file displayed.

Each successful file search displays the number of matching files and the total number of bytes used by them.

Finding a Directory

Use FileFind to find directories as well as files. Press <F6>; when you are prompted to enter a file name, enter the directory name followed by a backslash (\) or press <F6> again.

FileFind searches the disk for a directory by that name. The same wildcard combinations are available as for finding a file. If FileFind finds a matching directory, it asks for confirmation that this is the directory you want. If you respond with a N, it looks for another instance of the directory name.

If you answer Y, it prompts for the file name you want to search for. Again, you can use wildcards. FileFind searches for matching filenames only in the directory you specified. It does not search in any of the subdirectories. This way, you can limit a search, or you can display all of the files in a certain directory by specifying *.* for the filename.

When FileFind finds a matching directory name, pressing D displays a summary of the contents of the directory: the number of files, bytes, subdirectories, and the total files and bytes in all subdirectories.

Saving Screens

You can save any disk map screen to a disk file. Press <F9> to save the screen. A question box asks for permission before saving it. If a report file is already open, the screen is saved into it. If not, a file called DRIVE*d*.SCR is opened on a drive other than the target drive; if the file exists, the screen is written to the end of the file.

If you want to write the file to a specific drive, you can enter a new drive letter for the file. Otherwise, press <Enter> to save the report to a file on disk, or press <Esc> to return to PowerScope.

PowerScope Function Key Summary

Key	**Caption**	**Function**
<F1>	*Summary*	Display a disk summary
<F2>	*Fragments*	Highlight fragments with !; toggles on and off.
<F3>	*ZoomIn*	Zoom one level closer for better resolution up to 1-to-1 resolution
<F4>	*ZoomOut*	Zoom one level out for wider scope until the entire disk is displayed
<F5>	*FileView*	Display information & contents of file in cluster under cursor
<F6>	*FileFind*	Find file or directory; displays entire disk at lowest resolution before prompting for filename
<F8>	*Top*	Display the top view: the entire disk at the lowest resolution
<F9>	*SaveScrn*	Save the current screen to a file
<F10>	*Main Menu*	Return to main menu
<Esc>	Escape	Stop the current operation or go back up one level of menu or display

Section 6

COMMAND PARAMETERS

Introduction

The Power Disk program can be used in one of two modes: Batch mode or Interactive mode. Most parameters work for either mode. When you use the parameters in Interactive mode, you to preselect the default values for interactive menu options. When you use the parameters in Batch mode, you specify the options Power Disk uses when it runs.

The parameters you can use in either mode are described first. Next, those parameters you use only in Interactive mode are described. Finally, those parameters you use only in Batch mode are described. A complete, condensed, alphabetical list of all Power Disk parameters is at the end of this section.

General Format

The Power Disk command, whether used for Batch or Interactive mode, looks like this:

```
PCKPDISK /R:C /U+ /I:246 <Enter>
```

where:

PCKPDISK is the name of the Power Disk program file. The name may be in upper or lower case.

/R:C	specifies a parameter which selects a particular program option. The parameter letter may be entered in upper or lower case. In this instance, the letter R tells the program to run in Batch mode and to reorganize disk drive C.
+	specifies the option associated with the parameter is active. If the parameter is specified with a minus (-) instead, the option is suppressed. If neither + nor - is specified, a + is assumed.
/I:246	associates the value 246 with parameter I. In this case, 246 indicates that Power Disk is to reorganize the disk on Mondays, Wednesdays, and Fridays. The colon is generally not required.
<Enter>	instructs DOS to execute the command. *Note:* In most commands in this section, the <Enter> is assumed and is not shown.

Specify the parameters on the command line when you enter the command PCKPDISK. You may specify multiple parameters in one command, each parameter beginning with a /, with or without a space before each /. The only limitation on the number of parameters specified in a command line is the DOS limit of 128 characters. The order of the parameters is not important.

Power Disk chooses default values for parameters you do not specify in the command.

Batch and Interactive Mode Parameters

General Options:

/B+	Beep active. /B- suppresses the beep at the end of reorganizations or when disk or report errors occur during reorganization. Default: /B+ (beep active)
/C+	Force colors on a system when Power Disk determines it has a monochrome monitor (for example, when using an alternate monitor on a laptop computer).
/CM	Force a monochrome display on any screen, whether Power Disk determines it to support color display or not. Default: Force neither; determine display from system
/?	Display a summary of the available parameter options. If you use this parameter with other load parameters, the program does not load or run. It simply displays the parameter summary. Default: None

Reporting Options:

/D:*x*	Send a report to a disk file on drive *x*. The report file is named DRIVE*d*.OPT, where *d* is the drive to be reorganized or analyzed. The target drive *x* cannot be the drive you are reorganizing.

/D*:*x* Send a report of only the summary screens to a disk file on drive *x*. The report file is named DRIVE*d*.ORG, where *d* is the drive to be reorganized or analyzed. The target drive *x* cannot be the drive you are reorganizing.

Default: None. To generate reports, you must both explicitly specify this option and you must specify the drive.

/L+ List all filenames, not just fragmented files, in analysis reports to the screen, disk, or printer. Using this parameter displays a complete directory tree.

Default: /L- (display only fragmented files)

/P:*x* Send reports of all activities to printer LPT*x*, where *x* is a number between 1 and 3.

/P*:*x* Send reports of only the summary screens to printer LPT*x*, where *x* is a number between 1 and 3.

Default: /P*:1 (print summary reports only on LPT1)

Note: In Batch mode and in Interactive mode, you can use /P* and /D* in the command line to specify summaries independently for printer and disk reports. When you are in Interactive mode and using the menus, the summary option within the Reporting Options menu affects both disk and printer reports.

File Handling Options:

/E:*x* Specify handling for empty files and directories:

/E:D	Automatically delete empty directories.
/E:F	Automatically delete empty files.

/E:FD Automatically delete both empty files and empty directories.
/E:N Do not automatically delete empty files or empty directories.

Default: /E:N (do not automatically delete either)

/H+ Remove erased entries from all directories. If /H- is specified /E:F and /E:D have no effect.

Default: /H+ (remove erased entries)

/M:*x* Change the criteria for which types of files are unmovable:

/M:H Hidden files can be moved
/M:R Read-only files can be moved
/M:N Neither hidden nor read-only files can be moved
/M:HR Both hidden and read-only files can be moved

Default: /M:R (move read-only files)

/N+ Specify that the program look in the \PCKWIK subdirectory for the ASCII file named PCKPDISK.FIL and use its information to place specific files on specific portions of the disk when reorganizing. If /N- is specified, Power Disk ignores the PCKPDISK.FIL file. See Appendix C for more information about controlling file placement on the disk.

Default: /N+ (use \PCKIWK\PCKDISK.FIL)

Protection Level Options:

/U+	Reorganize with protection level set to Unprotected. This provides faster reorganization and can be used when no power failure is likely. In the case of a power failure, some file data may be lost. Note that if you use /V+ (Verify) you must use protection (/U-). Default: /U- (protected)
/V+	Reorganize with protection level set to Verify. Power Disk reads each disk write again and compares it to the original data. Verify is recommended for disks that may have unreliable media. Default: /V- (no verification)

Error Correction Options:

/F+	Power Disk automatically fixes *lost chain* and *invalid subdirectory* errors found during reorganization, without asking permission. After fixing these errors, Power Disk writes the correct information to the disk. /F- requires that you give permission during Analysis for each error to be fixed. Power Disk refuses to reorganize a disk if these errors remain. Default: /F- (requires permission)

Strategy Mode Options:

/S:*x* Set the reorganization strategy mode:

/S:S or /S:1	Speedy Reorganization
/S:F or /S:2	Fragmented Files Last
/S:D or /S:3	Directories in Order
/S:P or /S:4	Partial Defragment Only

Default: /S:S (speedy strategy)

Interactive Mode Parameters

/C0 Use the standard color scheme on color monitors (white boxes with cyan background, blue outlines and blue lettering).

/C1 Use the first alternate color scheme on a color monitor (blue boxes with white outline on white background).

/C2 Use the second alternate color scheme on a color monitor (blue boxes with white outline on black background).

Default: /C0 (use standard colors)

/W+ Initially display the dynamic disk map during reorganization. /W- initially uses the name list display instead.

/W* Automatically zoom in on the disk map, when possible, during reorganization. Pressing <F8> or <F4> to zoom out or <F9> to change displays disables automatic zooming for that reorganization.

Default: /W+ (disk map display)

Batch Mode Parameters

/A:*d* Analyze disk drive *d* and, on request, issue an analysis report. Automatically tells Power Disk to run in Batch mode. Note that you cannot Analyze at the same time you Sort, Reorganize or Test the disk. You must use separate batch commands.

If you do not specify a target drive, Power Disk uses the default drive. Request an analysis report by specifying either a disk report (/D), a printer report (/P) or both.

Default: If no target drive is specified, Power Disk uses the DOS default drive.

/I:*x* Reorganize, test or sort only if today matches the specified days of the week. *X* is an integer between 1 and 7. 1 indicates Sunday and 7 indicates Saturday. You may specify up to 7 days, separating each number by a comma, space, colon, or no separator. For example:

/I:7	Reorganize if today is Saturday
/I:2,4,6	Reorganize if today is Monday, Wednesday, or Friday
/I:134567	Reorganize if today is any day except Monday

Default: /I:1234567 (all days)

/IF Reorganize only if this is the first time today that Power Disk has been run on this drive with the /IF parameter. Anytime you use the /IF parameter, Power Disk keeps a record for each drive in the file \PCKWIK\PCKPDISK.DAT and does not run again on that drive on the same date.

You may run Power Disk any number of times on the same date if you do not use the /IF parameter.

/IF- reorganizes the disk only if Power Disk has already been run with the /IF parameter once today. Typically, you use this to analyze or partially reorganize your disk.

Note: Power Disk creates the PCKPDISK.DAT file if it does not already exist. If the file contains invalid information, Power Disk displays a message and runs, ignoring the /IF parameter. Keep the Power Disk program and the PCKPDISK.DAT file in the \PCKWIK subdirectory.
Default: None

/IR:*d* Reset the PCKPDISK.DAT file so it appears as if drive *d* has not been reorganized today. With no drive letter specified, Power Disk resets all drives. You can use either /IR *or* any other parameters; they are mutually exclusive.
Default: None

/I- The normal Batch mode display appears only if the criteria for /I:*x* and /IF parameters are met. If the conditions are not met, Power Disk displays nothing. To specify no screen output even if the criteria are met, use the /Y- parameter.
Default: /I+ (always display)

/R:*dx* Reorganize disk drive *d* using fragmentation level *x*. Automatically tells Power Disk to run in Batch mode. Note that you cannot Reorganize at the same time you Analyze, Sort or Test your disk or reset the configuration file. You must use separate batch commands.

You must specify a target disk drive. In addition, you may specify to conditionally reorganize, depending on the state of fragmentation. The level number *x* may be an integer between 0 and 4:

0 Always attempt to reorganize the disk.
1 Reorganize if 1% or more of the disk is fragmented (slightly fragmented disk).
2 Reorganize if 6% or more of the disk is fragmented (moderately fragmented disk).
3 Reorganize if 16% or more of the disk is fragmented (significantly fragmented disk).
4 Reorganize if 33% or more of the disk is fragmented (very badly fragmented disk).

An analysis is always done before reorganization so that the software does not attempt to reorganize a faulty disk.

Default: The fragmentation level defaults to 0; you must specify a target drive.

/T:*dn*- Test disk *d* in batch mode *n* times, checking for integrity, media reliablity, data readability and fragmentation levels. Do not query before fixing any problems found. *N* is a value from 1-9. Note that you cannot test the disk at the same time you Analyze, Sort or Reorganize.

Default: Test the DOS default drive one time, without asking.

/T:*dn*+ Test disk *d* in batch mode *n* times, asking before fixing each problem found. *N* is a value from 1-9.

/Y+ Use screen output during batch mode. /Y- stops any messages from going to the screen. You can to abort the program by pressing <Esc> at any time, but no confirming message displays. Default: /Y+ (use screen output)

/ZLfop Sort the directory givne by path *p*; sort its lower-level directories also. If you do not use L, only the current level directory is sorted. Note that you cannot Sort your disk at the same time you Analyze, Test, or Reorganize it. You must use separate batch commands.

F is the field to sort by. You can specify any or all of the four options. The first option you give is the primary sort field; files are sorted by this field first. The second is the secondary sort field. Files are then sorted in order of this field, and so on. *F* is one or more of:

N file name
E file extension
T date and time
S file size

O specifies the sort order. There is one sort order for each sort field. It must come directly after the field, and you can have up to four field/order pairs in each sort command. *O* is one of:

+ for ascending order
- for descending order
U for unsorted

P must be a complete path, including the drive specifier (letter and colon). You must use a \ after the drive specifier unless you wish to sort the current directory.

Default: If no drive is specified, the current drive is the default. If no path is specified and \ is not included, the current directory is sorted. If no sort field is specified, the default is to sort first by Name and then by Extension. If no order is specified for a particular sort field, the default is ascending order.

Examples

Example 1:

```
PCKPDISK /R:C
```

Meaning: Reorganize disk drive C in Batch mode with all default settings: on any day of the week, beep active, normal colors, and empty files and directories preserved. It asks permission to fix errors, removes erased file entries from directories, has the display on, moves read-only files but not hidden files, and uses Speedy strategy in protected mode.

Example 2:

```
PCKPDISK /D:C /U+
```

Meaning: Run Power Disk in Interactive mode with all default values except that the reorganization is done Unprotected. Reports which are requested are sent to disk drive C.

Example 3:

```
PCKPDISK /R:C /S:P /IF- /I-
PCKPDISK /R:C /S:D /IF /I:36 /I-
PCKPDISK /R:C /S:S /IF /I12457 /I-
```

Meaning: Whenever this set of three commands is run, drive C is reorganized. The first time it is run each Tuesday or Friday, drive C is reorganized using the Directories in Order strategy. The first time on other days, it uses the Speedy Reorganization strategy. Each subsequent time these commands run during the day, the disk is partially reorganized. Only the command that actually reorganizes creates a display on the screen.

Example 4: `PCKPDISK /ZL N+ T- C:\`

Meaning: Sort the root directory of disk drive C: and all lower-level directories. Sort first by file name in ascending alphabetical order; then sort by date and time in descending order.

Appendix A

ERROR MESSAGES

Allocation error -- File size(s) conflict with directory information.

Explanation: The information found in a directory is inconsistent with the structure of the specified file. Some or all of the file may be lost. Run DOS CHKDSK.

ALLOCATION ERROR: Incorrect size for file: *xxxxx.xxx*

Explanation: The information found in a directory is inconsistent with the structure of the specified file. Some or all of the file may be lost. Run DOS CHKDSK.

Already reorganized this disk today. Conditional reorganization not done.

Explanation: You requested that the disk be reorganized once per day and it has already been reorganized. The program terminates and no reorganization is done.

Another program is monitoring the printer. Make sure no print spooler uses the disk for storing print data

Explanation: Another program was detected using the parallel printer port, and you have requested a report to the printer. This is not an error, but if you have a print spooler that uses the target disk for spooling print data, it may modify the disk during reorganization with undesirable results.

Cluster *xxxx* failed read test *n* times. File = *filename*. Cannot read data. Relocate it anyway?

Explanation: A cluster which is part of file *filename* cannot be read after *n* attempts. If you answer yes, both the readable and the unreadable data is read one sector at a time and moved to a new location, if a large enough readable location is found. Since it is likely that the data cannot be read because there is a bad spot on the disk, relocating the data may enable Power Disk to read the data after it has been moved. Power Disk tells you how many sectors in the cluster were successfully read.

Cluster *xxxx* failed read test *n* times. File = *filename*. Cannot read data. Move the data and mark the cluster Bad?

Explanation: A cluster which is part of file *filename* cannot be read after *n* attempts. If you answer yes, both the readable and the unreadable data is read one sector at a time and moved to a new location, if a large enough readable location is found. Since it is likely that the data cannot be read because there is a bad spot on the disk, relocating the data may enable Power Disk to read the data after it has been moved. Power Disk tells you how many sectors in the cluster were successfully read and marks the cluster as bad so that DOS will no longer use it to store data.

Cluster *xxxx* failed read test *n* times. File = *filename*. Unmovable file! Cannot relocate now.

Explanation: A cluster which is part of file *filename* cannot be read after *n* attempts. Because the file is a special, Unmovable file, and you chose the option not to move Unmovable files, Power Disk cannot move it to a new location.

If you want to be able to move the file, you must change the option to make the file movable and then rerun Disk Test. Since it is likely that the data cannot be read because there is a bad spot on the disk, relocating the data may enable Power Disk to read the data after it has been moved.

Cluster *xxxx* failed read test *n* times. No empty space to move the data to! Delete some files and try again.

Explanation: A cluster which is part of file *filename* cannot be read after *n* attempts; ideally Power Disk would move the file to another location. However, there is no room on your disk big enough for the file to move to. If you want to be able to move the file, you must exit Power Disk, delete some files or move them to another disk to make room, the run Power Disk again.

Cluster *xxxx* failed read test *n* times. This cluster is currently not being used. Do you want to mark it bad?

Explanation: A cluster which is empty cannot be read after *n* attempts. If you answer yes, Power Disk marks the cluster as bad and DOS won't use the cluster.

Cluster *xxxx* cross-linked

Explanation: Due to a hardware or software failure earlier, the specified cluster number is apparently being used by two different files. Run DOS CHKDSK to obtain more information. You may want to copy the two files to a different disk and analyze them. The end of one of the files probably contains data from the other file.

CRITICAL ERROR *xxxx* has occurred. Error occurred on device *d*.

Explanation: One of the following DOS errors has occurred which makes it impossible for Power Disk to continue. Correct the error if you can and try again. If you cannot determine the source of the error, check your DOS manual for more information.

Drive not ready
Unknown command
Data error (bad CRC)
Bad request structure length
Seek error
Unknown media type
Sector not found
Printer out of paper
Write fault
Read fault
General failure
Invalid disk change

Data verification error: Data read does not match data written. Potential disk media problem.

Explanation: You specified the Verify option, and Power Disk detected that some of the data written to the disk could not be correctly read. You can either retry or abort. If you retry, the data may be read correctly; the default is to retry. If you abort, Power Disk allows you to fix the media problem.

DIAGNOSTIC INFORMATION INCOMPLETE DUE TO DISK ERRORS FOUND.

Explanation: The Analysis summary is not accurate since disk structure errors were found on the disk.

DIRECTORY ENTRY INVALID: THE ABOVE DIRECTORY HAS CLUSTER NUMBER 0!

Explanation: A subdirectory has been incorrectly created with an invalid cluster number. Any files in the invalid subdirectory may actually appear in the root directory. *Warning:* **Do NOT** perform a wildcard delete using *.*! Run DOS CHKDSK /F to attempt to fix the problem.

DIRECTORY ERROR: Corrupted data in directory: *xxxxxx.xxx*

Explanation: The information found in a directory has been corrupted. It may be completely invalid. Run DOS CHKDSK /F to obtain more information.

DISK ALLOCATION ERROR: *xxx* CLUSTERS AT *yyyy* ALLOCATED BUT NOT REFERENCED! Delete these clusters from the disk? (Y/N)

Explanation: Disk space which is marked as "used" is not really being used by any file. Power Disk can mark the area "available" and continue, or you can exit and run DOS CHKDSK /F to turn the clusters into files so you can examine the data.

Disk error on Drive *d*: Reading from a Directory.
Disk error on Drive *d*: Reading from a FAT sector.
Disk error on Drive *d*: Writing near DATA cluster # *xxxx*
Disk error on Drive *d*: Writing to a Directory.
Disk error on Drive *d*: Writing to a FAT sector.
Disk error on Drive *d*: Reading near DATA cluster # *xxxx*

Explanation: A disk media error occurred while reading or writing the disk. You can retry the operation or abort. Aborting terminates the current reorganization or analysis.

Disk error on report drive. Closing incomplete report file.

> Explanation: You specified a disk file report, but a disk error unexpectedly occurred on the report disk in the middle of reporting. The report is canceled but contains all information up to this point. The Analysis or Reorganization continues.

Disk Error reading Report Drive *d*: No disk file report will be made.

> Explanation: The specified disk report could not be created. The reorganization continues without a disk report.

Disk Error reading target drive *d*: Batch Mode Aborted.

> Explanation: The specified target drive could not be accessed correctly; it cannot be reorganized.

Disk has no fragmented files, conditional reorganization not done.
Disk is not Very Badly Fragmented, conditional reorganization not done.
Disk is only Moderately Fragmented, conditional reorganization not done.
Disk is only Slightly Fragmented, conditional reorganization not done.

> Explanation: A conditional reorganization was specified based on the level of fragmentation of the disk but the disk was not fragmented enough; no reorganization is done.

Disk read failure during reorganization. Try to fix this disk problem?

> Explanation: Power Disk encountered an error reading a sector which is part of a file or subdirectory. If you reply yes, Power Disk relocates the data in the unreadable cluster and marks the cluster bad.

DOS disk information conflicts with boot record data. Aborting.

Explanation: The above errors occur as a result of trying to read the boot sector and determine the characteristics of the drive. Some error was encountered in reading the disk, or in the contents of the boot sector. The disk appears to be incompatible with Power Disk.

Drive *d* is being used as a JOINed drive. It cannot be reorganized until JOIN is cancelled.

Explanation: The drive you specified has been assigned to a subdirectory with the DOS JOIN command. You must cancel the JOIN before Power Disk can reorganize the drive.

Drive *d* is being used as a SUBST drive. It cannot be reorganized until SUBST is cancelled.

Explanation: The drive you specified has been assigned to another drive with the DOS SUBST command. You must cancel the SUBST with the /D parameter before Power Disk can reorganize the drive.

Drive not ready error on Drive *d*:

Explanation: A disk media error occurred while reading or writing the disk. You have the option to retry the operation or abort. Aborting terminates the current reorganization or analysis.

Error in analysis of fixed drive. PowerScope aborted. Run Analyze.

Explanation: You selected PowerScope, but it discovered some problem with reading the disk or in its file structure. DiskView cannot run. Run CHKDSK /F to fix the problems.

Error opening file *name*

Explanation: Power Disk got an error from DOS when it tried to open file *name*. Check that the file is a valid file.

Error reading the first FAT. Second FAT is OK.

Explanation: Part of the first system File Allocation Table cannot be read correctly. The copy in the Second FAT table is valid so the disk can be used correctly, but it tends to slow down system performance.

Error reading the second FAT table. First FAT is OK.

Explanation: Power Disk had a problem reading the second copy of the File Allocation Table; but because it successfully read the first copy it can continue what it was doing.

Error writing the first FAT. Second FAT is OK.
Error writing the second FAT. First FAT is OK.

Explanation: During reorganization, errors were encountered in writing to one of the File Allocation Tables. If neither FAT could be written, you would have a serious disk problem and the reorganization would be aborted.

Errors encountered in Reorganization. Program aborted.

Explanation: An unexpected disk error was encountered during reorganization, causing the program to abort. Run DiskTest to verify disk media.

Errors in disk structure. Cannot reorganize; Program aborted.

Explanation: The disk cannot be organized because some problems were found in the disk file structure. Run Analyze and fix problems, then try again to reorganize.

Errors were found on this disk, PowerScope ABORTED. Run Analyze for details.

> Explanation: You selected PowerScope, but it discovered some problem with reading the disk or in its file structure. PowerScope cannot run. Run Analyze to determine the problem; run CHKDSK /F if needed to fix the problem.

Errors were found on this disk, so I will not attempt to reorganize.

> Explanation: You have selected Reorganize, but the disk was found to have disk structure problems so it cannot be reorganized. Run Analyze, and if necessary, CHKDSK /F.

Error writing to the printer. Fix the printer and try again.

> Explanation: You have specified a printer report but the printer is not responding correctly.

Fatal Error: Error writing to both File Allocation Tables. Aborting.

> Explanation: During reorganization, errors were encountered in writing to one or both of the File Allocation Tables. If neither FAT could be written, you have a serious disk problem and the reorganization must be aborted.

Fatal Error: Failed to correctly read both FATs. Aborting.

> Explanation: Some portion of the File Allocation Table could not be read from either the first or second copies. This is a serious disk problem as DOS cannot access file data.

FATS don't match!

Explanation: Both the first and second File Allocation Tables can be read, but do not contain the same information. If there are no other problems on the disk, the first FAT has the correct information and the second FAT is correctly updated in the process of reorganization.

File Allocation Error: *xxx* Clusters at *yyyy* referenced but not allocated

Explanation: A file is using disk space which is marked as "available". Run DOS CHKDSK /F to fix this problem.

File Error: Incorrect file linkage in file: *xxxxxx.xxx*

Explanation: The information found in a directory is inconsistent with the structure of the specified file. Some or all of the file may be lost. Run DOS CHKDSK /F to fix the problem.

First time for this disk today. /IF- Conditional reorganization not done.

Explanation: You requested that the disk only be reorganized if it has already been done once today. No reorganization has been done yet today. The program terminates and no reorganization is done.

Fragmented by unmovable files or bad blocks, no conditional reorganization.

Explanation: A conditional reorganization was specified based on the level of fragmentation of the disk but the disk was not fragmented enough; no reorganization is done.

I cannot support a 12-bit FAT if the sector size not equal to 512 bytes

Explanation: The disk is valid but cannot be used by Power Disk because:

1. The sector size is less than 512 bytes. This could be the VDISK RAM disk or a very old diskette format.
2. The sector size is greater than 512 bytes but the File Allocation Table uses 12-bit entries. This occurs only on very large disks with very large cluster sizes.

Inconsistent FAT information. Unable to continue. Reorganize aborted -- Run Analyze.

Explanation: Either the first FAT doesn't match the second FAT or the memory copy of the first FAT doesn't match the physical copy of the first FAT, probably because a TSR has written over the memory copy or one of the FATs has been trashed. Run Analyze to determine the problem.

Note: Do **not** run any TSRs while you are running Power Disk! Disable or unload all memory-resident programs when you reorganize your disk.

Information in boot sector does not match information from DOS. Unable to continue.

Explanation: The information contained in the boot sector of the disk itself does not match what DOS reports about the drive. Power Disk cannot continue working on this drive. You may have an incompatible version of DOS or an incompatible device.

Insufficient disk space for report file. Closing incomplete report file.

Explanation: You specified a disk file report, but the report has completely filled up its disk in the middle of reporting. The report is canceled but contains all information up to this point. The Analysis or Reorganization continues.

Internal Error *xx*: ....

Explanation: An unexpected error has occurred in Power Disk's internal tables. Write down the error number (*xx*) and contact Multisoft Technical Support; see the inside front cover for the telephone number. The current Analyze or Reorganize aborts immediately when you press any key.

Internal Limit: Directory has too many levels for this program. Not enough stack space to continue...press any key to return.

Explanation: This disk exceeds Power Disk's limit of 32 levels of directories. You need to reduce the depth of the directory structure in order to use Power Disk.

Invalid drive letter specified.

Explanation: You specified saving a PowerScope screen to a disk which does not exist. Try another drive.

Limited disk space to defragment files. Reorganization will take much longer. Continue?

Explanation: The disk is very full of files, so reorganization takes a very long time. You can abort by answering no, then delete some files and run Power Disk again, or you can answer yes to have Power Disk run anyway.

Media error on removable drive. PowerScope aborted. Run Analyze.

Explanation: You selected PowerScope, but it discovered some problem with reading the disk or in its file structure. PowerScope cannot run on a disk with file structure problems. Run CHKDSK /F to correct the problems and reload Power Disk.

My keyboard monitor has been replaced by another program! You may need to REBOOT the system and change load order.

Explanation: Another program has taken over the keyboard monitor. In some cases the system may now be dead. If not, you can use Power Disk, but it is not able to protect against unexpected cancellation from the keyboard. We suggest you remove all memory-resident programs before running Power Disk and that you be certain Power Disk is the only program running.

No comparing of FAT tables due to a previous read error.

Explanation: Normally, Analyze attempts to compare the two copies of the DOS File Allocation Table, but since some part of these tables could not previously be read correctly, it skips over that test.

No fragmented files on this disk. Close up empty spaces?

Explanation: You have chosen a strategy that both defragments the disk and closes up empty spaces. There are no fragmented files but you can still close up the empty spaces if you like. Choosing Yes closes up the spaces; choosing No returns you to the main menu.

No fragmented files on this disk. Re-order the disk by directory?

Explanation: You have chosen Directories in Order strategy and there are no fragmented files. You can still re-order the files on your disk. Choosing yes closes up empty spaces and moves the files into the order you have chosen; choosing no returns you to the main menu.

Non-Fatal Error: Invalid sub-directory entry in directory *xxxxxx.xxx*. Write correct directory information to the disk? (Y/N)

Explanation: A subdirectory on the disk has an invalid reference to itself or its parent directory. This only prevents correct usage of the DOS ".." and "." operators. It can be easily fixed by Power Disk.

Not enough empty disk space to defragment all files. Continue with a LONGER, complete reorganization? (Y/N)

Explanation: You selected the Partial Defragment Only strategy. Not all the fragmented files could be defragmented into the existing empty space on the disk. You may stop the reorganization or continue with a longer method.

Not enough memory to sort directory.

Explanation: Power Disk cannot find enough conventional memory to sort your directories. Increase your physical memory by removing TSRs and device drivers so Power Disk can run faster. *Note:* do not run any TSRs when Power Disk is running! Always disable or unload any memory-resident programs before loading Power Disk.

Not the specified day. Conditional reorganization not done.

Explanation: The criteria for a conditional reorganization command was not met. No reorganization is done.

Read error in the first FAT, the second FAT or the root directory. This DOS area cannot be relocated. Reorganization aborted.

Explanation: Power Disk has encountered an error trying to read the DOS system area of the disk during a reorganization. Because these areas cannot be relocated, the reorganization stops.

Run Analyze or DOS CHKDSK before running this program again.

Explanation: You have selected Reorganize, but the disk was found to have some disk structure problems, so it cannot be reorganized. Run Analyze or CHKDSK /F.

Second File Allocation Table does not match the first. Copy first FAT onto the second FAT?

Explanation: The second FAT table either could not be read or did not match the first FAT table. The first FAT table is completely valid, so the disk can function correctly. Copying the first FAT onto the second FAT assures that they match.

Sector size in boot sector does not match information from DOS. I will use the boot sector information.

Explanation: The information about the disk retrieved from the disk's boot sector is not the same as the information DOS has about the characteristics of the drive. Power Disk uses the contents of the boot sector; this may cause problems later in Power Disk if the boot sector information is invalid.

Sector *xxx* failed read test *n* times. This is the DOS Boot Sector, a sector in the first FAT, a sector in the second FAT, or a DOS Root Directory sector. This area cannot be relocated.

> Explanation: Power Disk has encountered an error trying to read the DOS system area of the disk during testing. These areas cannot be relocated, but the testing continues.

Selected drive contains report file. Close file and stop disk reports?

> Explanation: You specified a disk report on the same physical drive to be reorganized. Specify a different report drive, or no reports.

Selected drive is disk to reorganize. Select any other valid drive letter.

> Explanation: You specified to save a PowerScope screen to the same physical drive as the target disk. Try another drive.

Sorry, I did not correctly find the boot sector. Cannot check this disk.

> Explanation: This was a result of trying to read the boot sector and determine the characteristics of the drive. The disk appears to be incompatible with Power Disk.

Sorry, no memory to save the screen.

> Explanation: You specified to save a PowerScope screen to a disk which does not contain enough empty disk space to hold the information. Try another drive.

The disk or program memory has been modified since Analysis! Aborting.

> Explanation: Power Disk detected that some other memory-resident program has modified the disk since it was Analyzed. Go back and run Analyze again. It may be helpful to remove the memory-resident program.

Same physical device as report file. Not allowed to prevent disk swapping.

> Explanation: You specified a disk report on the same physical (but not logical) drive as you wanted to reorganize. Specify a different report drive, or no reports.

There are more than 32,768 files on this disk. Cannot reorganize.

> Explanation: Your disk has more than the program's limit of 32,768 files. You must delete some files before it can work on the disk.

There is little empty space on the disk, so reorganization may be slower. Do you want to reorganize anyway?

> Explanation: Since there are less than 64K bytes of free disk space on the disk, Power Disk cannot reorganize at its top speed, but continues if you select Y.

There is not enough system memory to run Power Disk on the selected drive.

> Explanation: Because of either a large disk with lots of files and directories, or because your conventional memory is limited, Power Disk does not have enough memory to build all the tables it needs to reorganize this disk even though it has reduced its buffers and tables as much as it can. Increase your physical memory by removing TSRs and device drivers so Power Disk can run faster. *Note:* do not run any

TSRs when Power Disk is running! Always disable or unload any memory-resident programs before loading Power Disk.

This directory is empty.

Explanation: A valid subdirectory currently contains no files or subdirectories. You may wish to remove the subdirectory if it is no longer being used.

This file has a size of 0.

Explanation: A valid entry in a directory has no disk space allocated to it. You may wish to delete such empty files if they are not special place holders.

Unable to create new PCKPDISK.DAT file.

Explanation: An error occurred trying to create the file PCKPDISK.DAT. It could be the disk is full, the root directory is full, the disk is write-protected, or the disk has a hardware error. Execution is aborted.

Unable to use this drive. DOS reports it as being a Network Drive.

Explanation: The logical drive letter you've chosen has been remapped as a network drive. Power Disk cannot work on network drives.

Unable to use this drive. Total number of disk clusters does not agree with DOS.

Explanation: The number of disk clusters reported by DOS does not match the number of clusters found in the boot sector. This may be a remote drive (over a network or a serial link) or there may be bad data in the boot sector. Power Disk cannot run.

Unknown parameter value /*x*. Program aborted.

Explanation: An unknown or invalid parameter value was input on the command line. Check Section 6 for a full list of available parameters and their correct use.

Unrecoverable printer error. Closing incomplete printer report.

Explanation: You specified a printer report, but an error unexpectedly occurred in printing in the middle of reporting. The report is canceled but the Analysis or Reorganization continues.

Warning: Media error accessing FAT. Successful after retry.
Warning: Media error near cluster # *xxxx*. Successful after retry.
Warning: Media error using Root Directory. Successful after retry.

Explanation: During reorganization Power Disk detected that DOS was able to correctly read the specified disk area only after retrying several times. The reorganization continues without problems, but you should note the disk location and later run the Disk Test part of Analyze to test that area.

WARNING: PCKPDISK.DAT file is invalid -- /IF command ignored.

Explanation: A /I command found a PCKPDISK.DAT file containing invalid data. The command is ignored.

WARNING: Unrecognized or incomplete Boot Sector information on the drive. Continue with analysis anyway? (Y/N)

Explanation: The boot sector was correctly read and appears to be valid, but it does not contain the boot signature required of all drives. Specify Y, then Analyze the disk. If no errors occur, the disk is compatible and can be reorganized safely. If many disk structure errors occur, do not attempt to fix them with this program. This disk is probably incompatible with Power Disk.

WARNING: Your disk directories have been modified. If DOS FASTOPEN is running in your system, you MUST restart the system now, to prevent DOS from using its obsolete directory information.

Explanation: DOS FASTOPEN keeps its own records of directory information, which Power Disk cannot change. If you have FASTOPEN installed, you see apparent (but not real) disk problems when accessing your directories after reorganizing a disk. Reboot the system immediately to avoid these problems if FASTOPEN is running in your system.

WARNING: Saving options to a file could cause problems if a disk reorganize or directory sort has taken place and TSRs like FASTOPEN are installed! Save anyway?

Explanation: This warning displays any time you save your options to a configuration file. It reminds you that it is always safest to save your options *before* modifying your disk with Power Disk.

Write-protect error on Drive *d*:

Explanation: The drive is write-protected. Remove the write protection and retry the operation or abort. Aborting terminates the current reorganization or analysis.

You are low on system memory. Some of Power Disk's activities may take more time.

Explanation: Because you either have a large disk with lots of files and directories or you have very little available conventional memory, Power Disk had to reduce the size of its file transfer buffers and it will take longer to do everything. Increase your physical memory by removing TSRs and device drivers so Power Disk can run faster. *Note:* do not run any TSRs when Power Disk is running! Always disable or unload any memory-resident programs before loading Power Disk.

You have fewer than 2 empty clusters on this disk. It cannot be reorganized. Delete some files and try again.

Explanation: Power Disk must have at least two empty cluster of disk space in order to reorganize a disk. Exit Power Disk, delete some files, and run Power Disk again.

Appendix B

RECOVERABLE DISK ERRORS

Recoverable disk errors are usually caused by the system stopping or restarting unexpectedly when writing a file. These errors may occur during a power failure when Power Disk or any other program is in operation or writing information to a disk.

Typically, you can fix these problems using DOS CHKDSK or Power Disk itself. These problems do not indicate any corruption of file data and do not prevent normal operation of your system.

Warning: Before fixing any of these problems, verify that the disk has no other serious problems. Run Power Disk completely through the Analyze option, without making any changes. You can also run DOS CHKDSK, without the /F parameter, so it won't automatically make changes. After determining that no serious problems exist on the disk, use Power Disk or CHKDSK to fix the problems.

Lost Clusters

Lost clusters is the most common error and most systems have this problem at one time or another. Power Disk calls this condition *Clusters Allocated but not Referenced.* DOS reports *x lost clusters found in y chains.* This condition occurs when disk space has been allocated for some data and formed into chains of clusters, but the space is no longer (or never was) connected to a valid file.

This problem may occur as a result of power loss while you were using Power Disk. In this case, the lost clusters represent extra copies of data that was being moved and they are not needed. You can remove these extra copies by using the Reorganizer during Analyze, or by using CHKDSK /F.

CHKDSK saves these lost file fragments into a new file and puts them in the root directory under a file named FILE*xxxx*.CHK (*xxxx* is a number). Power Disk deallocates them without saving the data in any file. Therefore, if you are unsure of how the fragments became lost, use CHKDSK to turn them into files that you can look at. For example, a lost chain may be the most recent editing you did when the system unexpectedly stopped. By saving the lost chain in a file, you can recover the data and add it to the original file.

Invalid Directory Entry

This error is not serious and both Power Disk and CHKDSK can fix it. Earlier versions of CHKDSK treated this as a serious error and asked you to turn the directory into a file. If you did, the directory data became a useless file, making all the files and subdirectories that were in that directory into lost chains. This is unnecessary.

The invalid entry is called .. or . (dot-dot or dot), which allows you to refer to the parent directory by using .. or to the current directory by using . in a DOS command line. However, you are not able to use .. if the entry does not correctly point to the parent directory.

Power Disk can easily fix the directory entry to its correct value during Analyze, if you give permission.

FATs Don't Match

Most disks have an extra copy of the DOS File Allocation Table (FAT), which records the allocation of disk space. The second copy of this table is always updated, but only used if there is a problem reading the first copy. Interrupting a program when it is between writing to the first copy and the second copy causes a mismatch between the two copies. This remedies itself when the old data in the second copy is updated as you work on your disk.

CHKDSK does not check for this condition. However, if your FATs don't match, you may also have lost chains. In the process of fixing the lost chains, the FATs are fixed when the second copy of the FAT is updated. If not, running Analyze allows the option of updating the second FAT copy so that it matches the first copy. Working on your disk for some time also updates the second copy.

Mismatched FATs becomes a problem when some portion of the first FAT cannot be read because of a damaged disk. This condition may exist without your knowledge since DOS just uses the information in the second copy. This may cause a slowdown in disk activity and a noticeable increase in disk activity.

Power Disk alerts you when there is a problem reading either FAT copy.

Appendix C

CONTROLLING FILE PLACEMENT WITH THE DIRECTORIES IN ORDER STRATEGY

Introduction

When you reorganize and defragment your disk, Power Disk moves files around to use the space on your disk efficiently. You may wish to keep some of your files or directories toward the front of the data area on your disk, you may wish to keep some files or directories together, or you may wish to have some of your files or directories placed toward the back of the available disk space.

Careful placement of files on the disk can result in much less file fragmentation and easier, faster, less frequent disk reorganization. Files which rarely or never fragment, such as program files, work well toward the front of the disk. Files which are accessed often and may frequently fragment usually are best placed at the end of the data area.

File placement is a subfunction of the Directories in Order strategy (/S:D) and can be used only when specifying Directories in Order. A special file named PCKPDISK.FIL controls where files are placed during reorganization. This file specifies what files or directories can go first, which should go last, and whether hidden or read-only files are affected. As Power Disk reorganizes, it puts files requested as FIRST toward the front of the disk and files requested as LAST toward the end of the disk. Between FIRST and LAST it places the rest of the directories and other files in directory order.

This file is not provided with Power Disk, but it is easy to create. See Appendix D for instructions on creating ASCII files. This file should be placed in the same directory as the Power Disk program files; preferably, this is the \PCKWIK directory.

General Format

The file-placement control file is made up of lines of the following format:

```
FIRST  C:\BIN\*.EXE  /D+  ;comment
```

or

```
FIRST  @PATH  ;comment
```

or in programming format:

```
[FIRST | LAST][{[drive:][path\file_spec][/D][/H][/R][/S]} | {@string}][;comment]
```

where:

FIRST	specifies file or directory is to be placed at the front.
LAST	specifies file or directory is to be placed at the back.

<u>Default:</u> FIRST

C:	specifies the disk drive the files are to be found on; in this instance, drive C. Default: If the drive letter is not specified, Power Disk moves the files specified on any disk being reorganized.
\BIN\	specifies the path where the files are found; here, in the \BIN\ directory. If no \ is included, it is inserted after the drive letter and Power Disk assumes the files are in the root directory.
*.EXE	specifies a file name, a subdirectory name, or a file specification, including DOS wildcard characters ? or *, using the same wildcard rules as DOS.
@PATH	specifies a DOS environment variable; in this case, the PATH variable. In this example, the directories defined by the PATH variable, and their files, are placed as specified by FIRST or LAST.
/D	specifies the attribute parameter; in this instance, D. The attribute parameters are D, H, R, and S and are described below.
+	indicates that files with this attribute should be moved. A minus sign (-) indicates that files with this attribute should not be moved. If no sign is specified, a + is assumed.
;	comment; any characters following the semicolon are ignored

Attribute Options

Note: The following discussion of attribute parameters assumes you have a basic understanding of the DOS concept of file attributes. See your DOS manual for background information.

The attribute parameters allowed in the file placement command lines are:

/D+ The file specification applies only to directory files.

Default: Move matching files regardless of whether they are directories.

/H+ The file specification applies only to files DOS has indicated as hidden files.

Note: For this parameter to take effect, hidden files must be allowed to move when running Power Disk, either by using the /M:H command or by modifying the file handling options from the menus. The default is not to move hidden files and this parameter does not override this.

Default: Move matching files regardless of whether they are hidden.

Warning: If you request that hidden files be moved at the time Power Disk is run, but only specified that some hidden files be placed first or last, all of the remaining hidden files on the disk are automatically placed in directory order. If some of these hidden files are used by a program's copy protection scheme, this might cause problems. One way to handle this situation is to mark certain files as not hidden (using a utility like Norton's Utilities), allow them to be moved by Power Disk (keeping all other hidden files in place), then re-mark them as hidden after reorganization.

/R+ The file specification only applies to files DOS has indicated as read-only files.

Default: Move matching files regardless of whether they are read-only.

/S+ The file specification applies to the directory indicated and any subdirectories below.

Default: Move only matching files

Examples

Example 1: `FIRST E:\*.BAT /S+`

Meaning: Move to the front of disk E all files with a .BAT file extension.

Example 2: `FIRST *.EXE /S+ /R-`

Meaning: Move to the front of any disk being reorganized all files with a .EXE extension, except those which are read-only.

Example 3: `LAST C:\DATA\*.DBF`

Meaning: Move to the end of the file data area on drive C all files in the subdirectory \DATA which have an extension of .DBF.

Example 4: `FIRST @PATH`

Meaning: Move to the front of any disk being reorganized all directories found in the PATH string, and all the files contained in those directories. Note that other environment strings (such as APPEND) can be specified if they are formatted in the same way as PATH. The format must be:

d:\path\filespec;d:\path\filespec

Example 5: `FIRST \*.* /H+ /R+`

Meaning: Move to the front of any disk being reorganized all files which are both hidden and read-only.

Example 6: `FIRST \*.* /D+ /S+`

Meaning: Move to the front of any disk being reorganized all directory files (but not other files). If this is the only command line, the disk is in this order:

1. The root directory
2. All directory files
3. The files within the root directory
4. The files within each subdirectory, in the order the subdirectories occur within the root directory

This is a useful variation on the basic Directories in Order strategy for those who prefer all the DOS directories toward the front of the disk.

Example 7:

```
FIRST  \AUTOEXEC.BAT
FIRST  \*.BAT  /S+
LAST  \DATA\*.DBF
LAST  \DATA\MISC.DBF
```

Meaning: The AUTOEXEC.BAT file is placed after the root directory, followed by the rest of the .BAT files. The .DBF files in the /DATA subdirectory are placed last with MISC.DBF placed as the very last file.

Note: Any files moved using a FIRST command are not included in any subsequent FIRST or LAST commands. Files moved using a LAST command, then included in subsequent LAST commands, are moved closer to the end of the data area.

Directories in Order strategy only affects the physical placement of your files on the disk. It does not affect the logical order in which files and directories are displayed using the DIR command. To change the logical order, use the Sort Directories option in either Batch mode or Interactive mode.

Appendix D

ACCESSING ASCII FILES

Normal DOS text files are called ASCII files. Unlike the files produced by most word processors, spreadsheets, and databases, ASCII files have no formatting information or special structure. The PDSKREAD.ME file on the distribution diskette, the DOS file CONFIG.SYS, and the DOS batch control files (*.BAT) are all ASCII files. The information below tells you how to display, create, and modify these files.

Displaying PDSKREAD.ME

The INSTALL program on the distribution diskette sets up a file named PDSKREAD.ME which contains supplemental program information and information which became available too late to be included in this edition of the manual. To display the information in the PDSKREAD.ME file, change to the subdirectory in which you installed Power Disk and type:

```
DISPLAY PDSKREAD.ME
```

Note: If you had the INSTALL program place the Power Disk files on a drive other than the default drive, specify the drive before changing directories.

The DISPLAY command displays the information in the file on your video monitor. The cursor keys and the <PgUp> and <PgDn> keys move the display to different parts of the file. Use the <Esc> key to exit the program.

Printing PDSKREAD.ME

To print the information in the PDSKREAD.ME file, type:

```
COPY PDSKREAD.ME PRN
```

Batch Files

Using DOS involves typing in one-line commands from the keyboard. Because you frequently repeat the same sequence of commands, DOS allows several commands to be placed together in a file and executed automatically. The files are called *batch files* and they use the file extension .BAT.

Executing Power Disk Automatically

DOS executes a batch file named AUTOEXEC.BAT each time DOS is restarted. This file contains commands that set up the environment of the PC, such as setting the date and time and setting up a sequence of directories to be searched whenever a command is entered. Many Power Disk users find it convenient to place a command in their AUTOEXEC.BAT file to run Power Disk conditionally each time the PC is rebooted.

Creating and Modifying Batch Files

There are three ways to create or modify an ASCII file.

1. Using the COPY command.
2. Using the EDLIN program.
3. Using a commercial word processor.

When you need to create or modify a particularly short ASCII file, it may be easier to use the COPY command to do so. (*Note:* The COPY command does not warn you if a file of the same name already exists. Be sure you do not already have a file with the same name before you begin editing.) To create or modify an ASCII file called PCKPDISK.FIL, you could enter:

```
COPY  CON  PCKPDISK.FIL
```

Then begin typing in the lines that you want to go in the file. Start each new line by pressing <Enter>. To start over, hold down the <Ctrl> key while pressing the C or <Break> key.

To save your work, press the <F6> key or hold down the <Ctrl> key while pressing Z. When you see a Z on your screen, press <Enter>.

Note: The DOS prompt does not appear on your screen while you are creating the file.

When you are creating or changing longer ASCII files, an editor is useful. DOS includes the EDLIN editor. Check your DOS manual for information on how to create and edit files with this editor.

The following sequence creates the same file as the one created by the COPY command above:

```
EDLIN  PCKPDISK.FIL
I
[the lines for the file go here]
<Ctrl>C
E
```

Note: If you don't see the words New File just after entering the command, you may be editing an existing file. If this is not what you want, type E<Enter> to exit without making changes.

The first line invokes the editor and tells it to create a new file called PCKPDISK.FIL. An asterisk appears as the prompt for the editor. The second line tells the editor you wish to insert a series of lines. A number 1 followed by a colon appears as the prompt for the insert mode. Then come the commands you wish to place in the file. To inform the editor that you are finished inserting text, hold down the <Ctrl> key and press C. The final line tells the editor to exit after completing the creation of the file.

You may own a word processor that is capable of creating ASCII files. Many word processors place special formatting codes in the files they create that confuse DOS when it tries to execute the file as a series of commands. These word processors usually have a way of either creating a file without the formatting codes (sometimes called "non-document mode") or converting a file with these codes into a file that does not have them (sometimes called "exporting the file" or "converting to standard ASCII"). Refer to your word processor documentation for information on how to create a file without formatting codes.

Appendix E

USING POWER DISK WITH VERY LARGE DISKS

Power Disk is the only disk defragmenter which can analyze, test, and optimize very large capacity disks drives or partitions (exceeding 300 Mb), including disks with a capacity as large as 1 gigabyte (1000 megabytes of storage). There are a few issues to keep in mind if you own a disk which has a large capacity.

Power Disk takes care that your data is safe when you reorganize, and thus a reorganization of a very large disk may take a long time. The amount of time it takes depends on a number of factors, including how much conventional memory you have available, how large your sector size is, and how badly fragmented your disk is.

To optimize your large disk in as short a time as possible, always unload all other memory-resident programs; this frees up as much conventional memory space as possible for Power Disk to use. And remember to defragment your disk regularly. The more often you defragment, the less fragmented your disk is each time you run Power Disk, especially if you use the Fragmented Files Last strategy.

Note that while reorganizing a large disk, Power Disk may pause for very long periods of time. No message displays, but Power Disk is working nonetheless. The pauses happen while Power Disk "thinks about" how it is going to best move data to keep your data safe and secure. If yours is an extremely large disk, these pauses may take as long as 8 or 10 minutes. Please be patient and let Power Disk do its work. If you find you have waited for 15 minutes or more, there may be a problem and your system may be hung; you may wish to call Technical Support.

When you invoke PowerScope on a very large disk and ask it to display your disks fragmented clusters, you might see the cursor jumping around the display. This is normal when working with a large disk. Power Disk marks each fragment after it is displayed, and the cursor tracks as each fragment is marked.

If you have any questions or problems when using Power Disk with large-capacity disk drives, please feel free to call our Technical Support team. They can help you determine what the problem might be and suggest a solution. Power Disk is the safest, fastest and most reliable disk optimizer you can buy and it is the only one that works reliably with large-capacity disks.

GLOSSARY

ASCII file

An ASCII file is any file which contains only characters represented by ASCII codes (the standard character codes for PCs). ASCII stands for the American Standard Code for Information Interchange. The first set of 128 characters, which uses the first 7 bits of a byte, is called the standard ASCII set. The second set of 128 characters, which uses all eight bits, is called the extended ASCII set. All 256 characters are used by PCs.

Back Slash (\)

The delimiter that DOS uses to separate directory names and file names.

Boot Record

The first sector on a disk or partition. This sector contains information on whether the disk is a system disk, contains DOS, and can be booted or is not a system disk. It also has the number of bytes per sector, the sectors per track, and other information about the disk or partition including information about the FAT.

Cluster

The smallest unit of disk file allocation. Even the smallest file, containing only a few bytes, requires one cluster of disk space. As a file grows it fills up a cluster; when additional space is required, another cluster is allocated. The actual size of a cluster in bytes is determined when a disk is formatted. Clusters are made up of one or more disk sectors. Generally, disks with larger partitions have larger cluster sizes.

Directory

DOS keeps track of files using a structure of directories of files arranged like a tree. The primary directory from which all other directories are accessed is called the root directory. A subdirectory appears as a special file within its parent directory. The root directory can contain a combination of subdirectories and other files. Subdirectories can, in turn, contain subdirectories and other files.

By using this nesting of directories, a tree of directories can be formed which reflects the logical relationship of the files on the disk. Each disk, or partition, contains one root directory and may, or may not, contain subdirectories. In this manual the term directory is used to indicate a directory that could either be the root directory or a subdirectory.

Disk

A mass storage device for your computer. Hard disks are permanently installed. Floppy disks (or diskettes) can be removed and stored elsewhere.

DOS

In this manual the term DOS refers to the DOS operating systems from Microsoft, called MS-DOS, and from IBM, called PC-DOS.

FAT

File Allocation Table. DOS uses FATs to keep track of disk clusters which are formed into chains. These chains are accessed through directories as files. Clusters are marked as in use, available, or bad. There are two identical FATs on each disk to assure reliable disk information.

Forward Slash (/)

The delimiter that Power Disk uses to separate command parameter options.

Fragmentation

The process in which DOS breaks files into pieces as it stores them on your disk. The longer you have a disk without defragmenting it, the more fragmented it becomes; as you delete, move and add files, DOS breaks them up more and more to fit into the spaces available on the disk.

Install

The process of moving a program and related files from distribution media, such as a diskette, to disk storage, either hard disk or floppy diskette.

Load

The process of moving a program from disk storage to your computer's memory so the program can run.

Parameters

Options to change the way Power Disk runs on your computer. Each parameter is specified by one or more letters preceded by a forward slash (/). See Sections 3, 4, and 6 for discussion of the available parameters and what they do.

Root Directory

The first-level directory; the base directory for DOS.

Sector

Sectors are the building blocks of files and clusters. Disk tracks are made up of sectors. Sectors usually contain 512 bytes each. A standard 360K-byte 5¼-inch diskette has 40 tracks per side containing 9 sectors each. Larger capacity diskettes have 15 or 18 sectors per track. Hard disks often have 17, 25, or 34 or more sectors per track.

Subdirectory

Any directory beneath the root directory.

Track

Tracks are the concentric circles on a disk that contain data. Each track is segmented into sectors. Generally the smaller the storage size of a disk the fewer the number of tracks and the fewer sectors per track. For instance a 360K-byte diskette has 40 tracks per side with 9 sectors per track. A 1.44M-byte diskette has 80 tracks per side with 18 sectors per track.

INDEX

/? 61
/A 41, 66
/B 61
/C 61, 65
/D 61, 62
/E 62
/F 64
/H 63
/I 45, 67
/IF 44, 46, 66
/IR 45, 67
/L 62
/M 63
/N 63
/P 62
/R 41, 43, 46, 67
/S 42, 43, 65
/T 41, 46, 68
/U 64
/V 64
/W 65
/Y 42
/Z 41, 46, 69

Analysis 10, 19
Analyze Only option 19
AUTOEXEC.BAT v, 11-13, 43, 105, 108

Back ups, need for 16
Bad blocks 82
Batch files 41
Batch mode 7, 11, 41, 42, 59
Beep 28, 61
Bernoulli boxes 6

Choose a disk drive 17, 29
Cluster
    description 49
    readable 23
    unreadable 24
Conditional reorganization 43

Directories in Order strategy 8, 34, 43
Disk cache, using with Power Disk 39
Disk Map 20, 26
Displaying options 36
DOS
    escape to 39
    CHKDSK 95-97
    FASTOPEN 13, 39, 92
    JOIN 13
    SUBST 13
    VDISK 13
Drive partitions 6
DRIVEd.ORG 31, 62
DRIVEd.SCR 57

Environment strings 104
Error Messages 73
Escape to DOS 39
ESDI hard drives 6

FATs Don't Match 97
File fragmentation 5
File Handling option 32
FileFind feature 55, 56
FileView feature 53
Fragmented Files Last 8
Function keys
    <F1> disk summary and help 58
    <F10> return to main menu 58
    <F2> display fragments 53, 58
    <F3> zoom-in 52, 58

  <F4> zoom-out 28, 52, 58, 65
  <F5> FileView 53, 58
  <F6> FileFind 55, 56, 58
  <F8> top view 28, 52, 58, 65
  <F9> display switch 28, 65
  <F9> save screen to disk 57, 58
  summary 58

Hard drives supported 6
Hidden files, moving 7

IDE hard drives 6
INSTALL iii, 15, 107
Interactive mode 7, 16, 59
Invalid Directory Entry 97

Large disks, and Power Disk 111
Lost chains 96, 97

Main menu 18
MFM hard drives 6
Modify options 29
  display/save 36
  file handling 32
  protection level 33
  reporting 30
  strategy 34
Mouse, using 3, 18
Moving files
  hidden 7, 32
  read-only 7, 32
Once-a-Day reorganization 44

Partial Defragment Only 8
PCKPDISK.CFG 30, 37, 41, 42
PCKPDISK.DAT 44, 45, 66
PCKPDISK.FIL 8, 35, 43
PDSKREAD.ME 2, 16, 107

Plus Passport 6
PowerScope 10, 25, 49
    disk map 50
    displaying files 53
    displaying fragments 53
    errors 79, 81, 84, 85, 88
    initial display 50
    introduction 49
    moving around 51
    zooming 52
Protection Level options 33, 64

Read-only files, moving 7
Reorganization scheduling 45
Reorganization strategies 8, 34, 42
    Directories in Order 8, 34, 43
    Fragmented Files Last 34, 43
    hints 35
    Partial Defragment Only 35, 43
    Speedy Reorganization 8, 34, 42
Reorganize option 41, 43, 67
Reorganize the disk 25
Reporting options 7, 10, 28, 30, 61, 62
RLL hard drives 6

Safety Features 9
Saving options 30, 36
SCSI hard drives 6
Sorting directories 9, 37, 46, 69
Speedy Reorganization 8, 34, 42

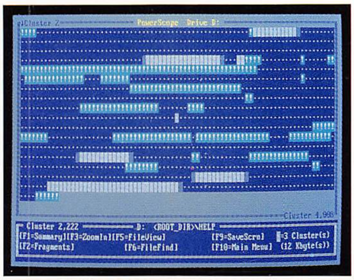
Testing a disk iv, 21, 68
Unmovable files 51

Zoom in 27, 52
Zoom out 28, 52

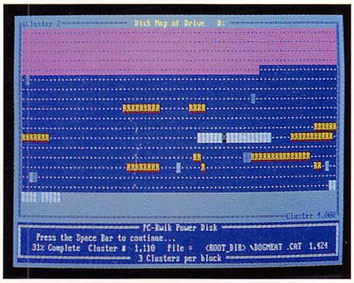
PC-KWIK POWER DISK.
FOR SAFER, FASTER HARD DISKS.

Give your disks a Power Tune-up.

Hard disks slow down – and eventually fail – due to lack of maintenance. That's because, over time, files get broken into small pieces and scattered over the disk.

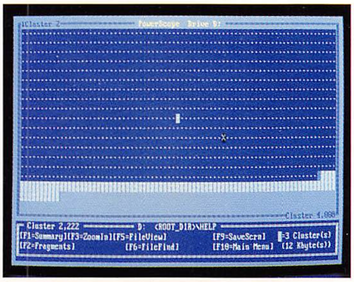


Power Disk's full screen mapping gives you a detailed view into your disks, at up to 1:1 resolution. Here a badly fragmented disk awaits reorganization.



```
Press the Space Bar to continue...
31% Complete  Cluster # 1,110  File =  <ROOT_DIR> \DOGMEAT .CAT  1,424
3 Clusters per block
```

After thorough testing, Power Disk goes to work, collecting scattered pieces of files and assembling them contiguously on the disk.



In minutes your disk is cleaned, packed and optimized for top performance.

Retrieving files becomes slower and harder as the drive heads jump around the disk picking up all the pieces. Furthermore, data can be routinely written to marginal sectors, putting the files at risk.

Power Disk tests your entire disk and helps correct problems before you lose data. Then it optimizes your drive by defragmenting and reorganizing files for top speed and reliability. Your drive runs faster, smoother, and safer.

Power Disk:

Defragments files for safe storage and speedy access.

Packs the disk so that files are at the front and all empty space is at the back of the disk.

Speeds up disk accesses and **Magnifies** the performance improvements of Super PC-Kwik® by placing file blocks sequentially.

Tests all areas of hard disks, diskettes or cartridges for reliability.

Remaps bad clusters, saving all readable data to safe areas.

Displays a full screen map of disk clusters with up to 1:1 zoom view – each block on the screen representing one cluster on the disk.

"The disk optimizer of choice is clearly PC-Kwik Power Disk."
Software Digest August 1990

POWER DISK SPECIAL FEATURES:

Fast reorganization encourages frequent use. Daily use allows even large disks reorganization in one or two minutes.

Safe reorganization, even during reboots or power loss. Your computer can be halted at any time during reorganization and your data is secure.

Flexible options. Choose from four reorganization strategies and three protection levels.

Batch mode allows simple, automatic daily use based on variables such as level of fragmentation, day of week and strategy desired.

Big Disks. Power Disk breezes through even the largest of drives.*

Big Screens. Disk maps can be shown on screens up to 50 lines high and 132 characters wide.

Mouse support. Testing, mapping and optimization at your fingertip.

System Requirements
IBM PC, XT, AT, 386/486, PS/2
and true compatibles.
DOS 2.0 to 5.0.
Any size hard drive, diskette, cartridge
or removable drive.*
Any size DOS partition.*
Hercules, monochrome, CGA, EGA,
VGA monitors up to 132 characters
and 50 lines.
Minimum RAM needed 320 Kb for
partitions up to 32 Mb.

*Disks up to and exceeding 1 Gb may be organized with 600 Kb of available system memory. Ability to work with very large drives depends on system memory, number of files and degree of file fragmentation.

90 Day Money-Back Guarantee.

MULTISOFT CORPORATION
The Leader in Performance Dynamics

MULTISOFT

15100 SW Koll Parkway
Beaverton, OR 97006
Sales 800-234-KWIK
(503) 644-5644
Fax (503) 646-8267

PC-KWIK POWER DISK
IBM 5¼

v1.10
S/N 617722

7 26036 00011 0